

ENCYCLOPÆDIA BRITANNICA.

4 Enc. 7-3.1

B A R

Barbarus,
Barbary.

BARBARUS (Francis), a noble Venetian, was a man of great fame in the 15th century, not only for learning, but likewise for a skilful address in the management of public affairs. He is author of a book *De Re Uxorica*, and some speeches.

BARBARUS (Hermolaus), grandson of the preceding, one of the most learned men in the 15th century. The public employments he was entrusted with early, did not prevent him from cultivating polite learning with great application. As he was very skilful in the Greek, he undertook the most difficult translations, and began with a famous paraphrase upon Aristotle. He then attempted Dioscorides, whose text he corrected, gave a translation of him, and added a commentary. But of all his works, there is none which has gained him so much reputation as that which he made upon Pliny; he corrected in him above 5000 passages, and occasionally restored 300 in Pomponius Mela. Pope Innocent VIII. to whom he was ambassador, conferred the patriarchate of Aquileia upon him. He was so imprudent as to accept of it without waiting for the consent of his superiors; though he could not be ignorant that the republic of Venice had made laws to forbid all the ministers they sent to the court of Rome to accept any benefice. His superiors were inflexible; and not being able to gain any thing upon them either by his flattery or his father's interest, the father died of grief, and the son soon followed him.

BARBARUS (Daniel), of the same family with the preceding, was patriarch of Aquileia, and famous for his learning. He was ambassador from Venice to England; and was one of the fathers of the council of Trent, where he acted with great zeal for the interest of the pope. He wrote, 1. A commentary upon Vitruvius. 2. *Catena Græcorum Patrum in quinquaginta Psalmos Latine versa*. 3. *La Pratica della Perspectiva*. He died in 1569, at 41 years of age.

BARBARY, a kingdom of Africa, including the states of *Algiers*, *Morocco*, *Tripoli*, and *Tunis*; (see those articles). This country contains almost the whole of what the Romans possessed of the continent of Africa, excepting Egypt. It stretches itself in length from east to west, beginning at the southern limits of Egypt, to the straits of Gibraltar full 35 degrees of longitude; and from thence to Santa Cruz, the utmost western edge of it, about six more, in all 41 degrees; so that the utmost length of Barbary from east to west is computed at above 759 German leagues. On the south, indeed, it is confined within much narrower bounds, extending no farther than from 27 to 35½ degrees of north latitude; so that its utmost breadth from

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north to south, does not exceed 128 German miles. More particularly, Barbary begins on the west of the famed mount Atlas, called by the Arabs *Ay Duacal*, or *Al Duacal*, inclosing the ancient kingdoms of Suez and Dela, now provinces of Morocco; thence stretching north-eastward along the Atlantic to the pillars of Hercules at Cape Finisterre, then along the coast of the Mediterranean, it is at last bounded on the city of Alexandria in Egypt.

Concerning the origin of the name *Barbary*, there are many conjectures. According to some, the Romans, after they had conquered this large country, gave it that name out of contempt and dislike to the barbarous manners of the natives, according to their custom of calling all other people but themselves *Barbarians*. Marmol, on the contrary, derives the word *Barbary* from *Berber*, a name which the Arabs gave to its ancient inhabitants, and which they retain to this day in many parts of the country, especially along the great ridge of the mountains of Atlas; and which name was given them on account of the barrenness of their country. According to Leo Africanus, the name of Barbary was given by the Arabs on account of the strange language of the natives, which appeared to them more like a murmur or grumbling of some brute animals than articulate sounds. Others, however, derive it from the Arabic word *bar*, signifying a desert, twice repeated; which was given by one *Ifric*, or *Africus*, a king of Arabia, from whom the whole continent of Africa is pretended to have taken its name. According to them, this king being driven out of his own dominions, and closely pursued by his enemies, some of his retinue called out to him *Bar, bar*; that is, *To the desert, To the desert*; from which the country was afterwards called *Barbary*.

Among the Romans this country was divided into the provinces of Mauritania, Africa, Propria, &c. and they continued absolute masters of it from the time of Julius Cæsar till the year of Christ 428. At that time Bonifacius the Roman governor of these provinces, having through the treachery of Ætius been forced to revolt, called in to his assistance Genseric king of the Vandals, who had been some time settled in Spain. The terms offered, according to Procopius, were, that Genseric should have two-thirds, and Bonifacius one-third, of Africa, provided they could maintain themselves against the Roman power; and to accomplish this they were to assist each other to the utmost.—This proposal was instantly complied with; and Genseric set sail from Spain in May 428, with an army of 80,000 men, according to some, or only 24,000 according to others,

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Barbary. thers, together with their wives, children, and all their effects. In the mean time, however, the empress Placidia having discovered the true cause of Bonifacius's revolt, wrote a most kind and obliging letter to him, in which she assured him of her favour and protection for the future, exhorting him to return to his duty, and exert his usual zeal for the welfare of the empire, by driving out the Barbarians, whom the malice of his enemies had obliged him to call in for his own safety and preservation.

5
Endeavours
unsuccess-
fully to
persuade
them to re-
turn.

Bonifacius readily complied with this request, and offered the Vandals considerable sums if they would retire out of Africa and return to Spain. But Genferic, already master of the greatest part of the country, first returned a scoffing answer, and then, falling unexpectedly on him, cut most of his men in pieces, and obliged Bonifacius himself to fly to Hippo, which place he invested in May 430. The siege lasted till the month of July the following year; when the Vandals were forced, by a famine that began to rage in their camp, to drop the enterprize, and retire. Soon after, Bonifacius having received two reinforcements, one from Rome, and the other, under the conduct of the celebrated Aspar, from Constantinople, a resolution was taken by the Roman generals to offer the enemy battle. The Vandals readily accepting the challenge, a bloody engagement ensued, in which the Romans were utterly defeated, a prodigious number of them taken, and the rest obliged to shelter themselves among the rocks and mountains. Aspar, who commanded the eastern troops, escaped with difficulty to Constantinople, and Bonifacius was recalled to Italy. Upon their departure, the Vandals over-ran all Africa, committing every where the most terrible ravages; which struck the inhabitants of Hippo with such terror, that they abandoned their city, which was first plundered, and then set on fire by the victorious enemy; so that Cirtha and Carthage were now the only strong places possessed by the Romans.

6
Romans
defeated by
Genferic
king of the
Vandals.

6
Peace con-
cluded with
the Van-
dals.

8
Genferic's
treachery.

In 435, Genferic, probably being afraid of an attack by the united forces of the eastern and western empires, concluded a peace with the Romans, who yielded to him part of Numidia, the province of Proconsularis, and likewise Byzacene; for which, according to Prosper, he was to pay an yearly tribute to the emperor of the east. Genferic delivered up his son Hunneric by way of hostage; but so great was the confidence which the Romans placed in this Barbarian, that some time after they sent him back his son. Of this they soon had reason to repent; for in 439, the Romans being engaged in a war with the Goths in Gaul, Genferic laid hold of that opportunity to seize upon the city of Carthage; by which he considerably enlarged his African dominions. Valentinian, the Roman emperor, however, maintained as long as he lived the two Mauritania, with Tripolitana, Tingitana, and that part of Numidia where Cirtha stood.

On the taking of Carthage, Genferic made it the seat of his empire; and in 440 made a descent on the island of Sicily, where he ravaged the open country, and even laid siege to Palermo. Not being able, however, to reduce that place, he soon returned to Africa with an immense booty and a vast number of captives. Being now become formidable to both empires, Theodosius emperor of the east resolved to assist Valentinian

against so powerful an enemy. Accordingly, he fitted out a fleet consisting of 1100 large ships; and putting on board of it the flower of his army, under the conduct of Arcovindas, Ansilus, and Germanus, he ordered them to land in Africa, and, joining the western forces there, to drive Genferic out of the countries he had seized. But Genferic in the mean time pretending a desire to be reconciled with both empires, amused the Roman general with proposals of peace, till the season for action was over; and, next year, Theodosius being obliged to recal his forces to oppose the Huns, Valentinian found it necessary to conclude a peace with the Vandals; and this he could obtain on no other terms than yielding to them the quiet possession of the countries they had seized.

So powerful was Genferic now become, or rather so low was the Roman empire by this time reduced, that in 455 he took and plundered the city of Rome itself, as is fully related under the article **Rome**; and, after his return to Africa, made himself master of the remaining countries held by the Romans in that part of the world. Hereupon Avitus, who had succeeded Valentinian in the empire, dispatched ambassadors to Genferic, putting him in mind of the treaty he had concluded with the empire in 442; and threatening, if he did not observe the articles at that time agreed upon, to make war upon him not only with his own forces, but with those of his allies the Visigoths, who were ready to pass over into Africa. To this Genferic was so far from paying any regard, that he immediately put to sea with a fleet of 60 ships; but being attacked by the Roman fleet under Ricimer, he was utterly defeated, and forced to fly back into Africa: he returned, however, soon after with a more powerful fleet, committing great ravages on the coast of Italy; but in a second expedition he was not attended with so good success; the Romans falling unexpectedly upon his men while busied in plundering the country, put great numbers of them to the sword, and among the rest the brother-in-law of Genferic himself. Not content with this small advantage, Majorianus, at that time emperor, resolved to pass over into Africa, and attempt the recovery of that country. For this purpose he made great preparations; but his fleet being surprised and defeated by the Vandals, through the treachery, it is said, of some of his commanders, the enterprize miscarried.

Notwithstanding this misfortune, however, Majorianus persisted in his resolution; and would in all likelihood have accomplished his purpose, had not he himself been murdered soon after by Ricimer. After his death, Genferic committed what ravages he pleased in the poor remains of the western empire, and even made descents on Peloponnesus and the islands belonging to the emperor of Constantinople. To revenge this affront, Leo made vast preparations for the invasion of Africa, inasmuch, that, according to Procopius, he laid out 130,000 pounds weight of gold in the equipment of his army and navy. The forces employed on this occasion were sufficient for expelling the Vandals, had they been much more powerful than they were; but the command being given to Basiliscus a covetous and ambitious man, the fleet was utterly defeated through his treachery, and all the vast preparations came to nothing. By this last defeat the power of the Vandals in Africa was

Barbary.

9
Makes
himself mas-
ter of all
the Roman
provinces.

10
Defeated
by Ricimer
and Majorianus.

11
Genferic
defeats the
eastern em-
peror's
fleet.

¹² **Barbary.** was fully established, and Genferic made himself master of Sicily, as well as of all the other islands between Italy and Africa, without opposition from the western emperors, whose power was entirely taken away in the year 476.

¹³ **Barbarity and tyranny of Genferic.** Thus was the Vandalic monarchy in Barbary founded by Genferic, between the years 428 and 468. If we take a view of that prince's government in his new dominions, it presents no very agreeable prospect. Being himself an absolute barbarian in the strictest sense of the word, and an utter stranger to every useful art, he did not fail to show his own prowess by the destruction of all the monuments of Roman greatness which were so numerous in the country he had conquered. Accordingly, instead of improving his country, he laid it waste, by demolishing all the stately structures both public and private, and all other valuable and sumptuous works with which those proud conquerors had adorned this part of their dominions. So that, whatever monuments the Romans had been at such an immense expence to erect, in order to eternize their own glory, the barbarous Vandals were now at no less pains to reduce into heaps of ruins. Besides this kind of devastation, Genferic made his dominions a scene of blood and slaughter by persecuting the orthodox Christians; being himself, as well as most of his countrymen, a zealous Arian; and for this his long reign is chiefly remarkable. He died in 477, after a reign of 60 years; and was succeeded by his son Hunneric.

¹⁴ **Hunneric a bloody tyrant.** The new king proved yet a greater tyrant than his father, persecuting the orthodox with the utmost fury; and, during his short reign of seven years and an half, destroyed more of them than Genferic had done in all his lifetime. He is said to have died in the same manner as the heresiarch Arius*; before which time his

¹⁵ **His terrible death. See Arius.** flesh had been rotting upon his bones, and crawling with worms, so that he looked more like a dead carcase than a living man. Concerning his successors Gutamund, Thrasamund, and Hilderic, we find nothing remarkable except that they sometimes persecuted, and sometimes were favourable to, the orthodox; and by his favour for them the last king was ruined. For, having unadvisedly published, in the beginning of his reign, a manifesto, wherein he repealed all the acts of his predecessors against the orthodox, a rebellion was the immediate consequence. At the head of the malcontents was one Gilimer, or Gildemar, a prince of the blood-royal, who by degrees became so powerful, as to depose Hilderic in the seventh year of his reign; after which he caused the unhappy monarch with all his family to be closely confined, and was himself crowned king of the Vandals at Carthage.

¹⁶ **Hilderic deposed by Gilimer.** Gilimer proved a greater tyrant than any that had gone before him. He not only cruelly persecuted the orthodox, but horribly oppressed all the rest, so that he was held in universal abhorrence and detestation when the Greek emperor Justinian projected an invasion of Africa. This expedition of Justinian's is said to have been occasioned by an apparition of Lætus an African bishop, who had been murdered some time before, but now commanded the emperor to attempt the recovery of Africa, and assured him of success. Accordingly, this, or some other motive, prevailed upon Justinian so far, that, notwithstanding his being at that

time engaged in a war with Persia, he sent a powerful fleet and army to Africa, under the command of the celebrated general Belisarius, who was for that reason recalled from Persia.

So much was Gilimer, all this time, taken up with his own pleasures, or with oppressing his subjects, that he knew little or nothing of the formidable preparations that were making against him. On the arrival of Belisarius, however, he was constrained to put himself into a posture of defence. The management of his army he committed to his two brothers Gundimer and Gelamund, who accordingly attacked the Romans at the head of a numerous force. The engagement was long and bloody; but at last the Vandals were defeated, and the two princes slain. Gilimer, grown desperate at this news, sallied out at the head of his corps de reserve, with full purpose to renew the attack with the utmost vigour; but by his own indiscretion lost a fair opportunity of defeating the Romans. For no sooner did they perceive Gilimer hastening after them at the head of a fresh army, than they betook themselves to flight; and the greatest part were dispersed in such a manner, that, had the king followed them close, they must have been totally cut off. Instead of this, however, stumbling unfortunately on the body of one of his slain brothers, the sight of it made him lose all thoughts about the enemy; and instead of pursuing them, he spent part of his time in idle lamentations, and part in burying the corpse with suitable pomp and dignity. By this means Belisarius had an opportunity of rallying his men; which he did so effectually, that, coming unexpectedly upon Gilimer, he easily gained a new and complete victory over him.

This defeat was followed by the loss of Carthage, which the barbarians had been at no pains to put into a posture of defence. After which Gilimer, having in vain endeavoured to obtain assistance from the Moors and Goths, was obliged to recal his brother Tzason from Sardinia. The meeting between the two brothers was very mournful; but they soon came to a resolution of making one desperate attempt to regain the lost kingdom, or at least recover their captives out of the hands of the enemy. The consequence of this resolution was another engagement, in which Tzason was killed with 800 of his choicest men, while the Romans lost no more than 50; after which Belisarius moving suddenly forward at the head of all his army, fell upon the camp of the Vandals. This Gilimer was no sooner apprised of, than, without staying to give any more orders to the rest of his army, he fled towards Numidia in the utmost consternation. His flight was not immediately known among his troops; but when it was, such an universal confusion ensued, that they abandoned their camp to the Romans, who had now nothing to do but plunder it; and not content with this, they massacred all the men found in it, carrying away the women captives.

Thus a total end was put to the power of the Vandals in Barbary, and the Romans once more became masters of this country. The Vandal inhabitants were permitted to remain as they were, on condition of exchanging the heresy of Arius for the orthodox faith. As for Gilimer, he fled with the utmost expedition to Medamus, a town situated on the top of the Pappuan mountain, and almost inaccessible by reason of its

Barbary.

¹⁸ **Defeats the Vandals.**

¹⁹ **Takes Carthage;**

²⁰ **And puts an end to the Vandalic monarchy.**

Barbary.

21
Gilimer's
extreme di-
stresses.

height and ruggedness. The siege of this place was committed to Pharas, an officer of great experience, who having shut up all avenues to the town, the unhappy Gilimer was reduced to the greatest straits for want of provisions. Pharas being soon apprised of the distress he was in, wrote him a most friendly and pathetic letter, earnestly exhorting him to put an end to the distress of himself and his friends by a surrender. This Gilimer declined; but at the same time concluded his answer with a most submissive request, that Pharas would so far pity his great distress as to send him a loaf of bread, a sponge, and a lute. This strange request greatly surprised Pharas; but at last it was explained by the messenger, who told him that the king had not tasted any baked bread since his arrival on that mountain, and earnestly longed to eat a morsel of it before he died: the sponge he wanted to allay a tumour that was fallen on one of his eyes; and the lute, on which he had learned to play, was to assist him in setting some elegiac verses he had composed on the subject of his misfortunes to a suitable tune. At this mournful report Pharas could not refrain from tears, and immediately dispatched the messenger with the things he wanted.

Gilimer had spent near three winter months on the summit of this inhospitable mountain, his misery hardening him still more against the thoughts of surrendering, when a melancholy scene in his own family at once reconciled him to it. This was a bloody struggle between two boys, one of them his sister's son, about a flat bit of dough laid on the coals; which the one seized upon, burning hot as it was, and clapped it into his mouth; but the other by dint of blows forced it out, and eat it from him. This quarrel, which might have ended fatally had not Gilimer interposed, made so deep an impression upon him, that he immediately dispatched a messenger to Pharas, acquainting him that he was willing to surrender himself and all his effects upon the conditions he had offered, as soon as he was assured that they were embraced by Belisarius. Pharas lost no time to get them ratified and sent back to him; after which he was conducted to Belisarius, who gave him a very kind reception. Gilimer was afterwards brought before Justinian in golden chains, whom he besought in the most submissive manner to spare his life. This was readily granted by the emperor; who also allowed him a handsome yearly pension to live upon as a private gentleman. But his mind and heart were too much unsettled and broken to enjoy the sweets of a private state; so that Gilimer, oppressed with grief, died in the year 534, the first of his captivity, and five years after he had been raised to the throne.

22
Kindly
treated by
Justinian

Barbary being thus again reduced under the power of the Romans, its history falls to be taken notice of under that of Rome. In the khalifat of Omar, this country was reduced by the Saracens, as we have already related under the articles ARABIA. It continued subject to the khalifs of Arabia and Bagdad till the reign of Harum Al Rashid, who having appointed Ibrahim Ebn Aglab governor of the western parts of his empire, that prefect took the opportunity, first of assuming greater powers to himself than had been granted by the khalif, and then erecting a principality altogether independent of the khalifs. The race of Aglab continued to enjoy their new principa-

24
Principal
city of the
Aglabites
founded.

lity peaceably till the year of the Hegira 297 or 298, during which time they made several descents on the island of Sicily, and conquered part of it. About this time, however, one Obeidallah rebelled against the house of Aglab, and assumed the title of khalif of Kairwan (the ancient Cyrene, and residence of the Aglabite princes.) To give the greater weight to his pretensions he also took the surname of Al Mohdi, or Al Mahedi, the *director*. According to some, also, he pretended to be descended in a right line from Ali Ebn Abu Taleb, and Fatema the daughter of Mahomet; for which reason, say they, the Arabs called him and his descendants *Fatemites*. He likewise encouraged himself and his followers by a traditional prophecy of Mahomet, that at the end of 300 years the sun should rise out of the west. Having at length driven the Aglabites into Egypt, where they became known by the name of *Magrebians*, he extended his dominions in Africa and Sicily, making Kairwan the place of his residence.

25
Driven out
by Al Moh-
di the first
Fatemite
khalif.

In the 300th year of the Hegira, Habbafah, one of Al Mohdi's generals, overthrew the khalif Al Mokhtader's forces in the neighbourhood of Barca, and made himself master of that city. After which he reduced Alexandria itself; and was making great progress in the conquest of the whole country, when Al Mokhtader dispatched against him his two generals Takin and Al Kasem, with an army of 100,000 men. Habbafah being informed that the khalif's troops were in motion, advanced at the head of his army to give them battle, and at last came up with them in an island called by the Arabs *Ard Al Khamsin*. Here he attacked them with incredible bravery, notwithstanding their forces was much superior to his; but the approach of night obliged both generals to sound a retreat.—The action therefore was by no means decisive, tho' extremely bloody, the khalif's generals having lost 20,000, and Habbafah 10,000. The latter, however, durst not renew the fight next morning; but stole off in the night, and returned home, so that Al Mokhtader in effect gained a victory. In the 302d year of the Hegira, however, Habbafah returned, possessed himself of Alexandria a second time, defeated a body of the khalif's forces, and killed 7000 of them upon the spot. What further progress he made at that time we are not certainly told; but in the 307th year of the Hegira, Abul Kasem, son to the Fatemite khalif Al Mohdi, again entered Egypt with an army of 100,000 men. At first he met with extraordinary success, and over-ran a considerable part of that fine country. He made himself master of Alexandria, Al Tayum, Al Baknasa, and the isle of Al Ashmaryin, penetrating even to Al Jizah, where the khalif's army under the command of Munes was posted in order to oppose him. In this country he found means to maintain himself till the 308th year of the Hegira. This year, however, he was entirely defeated by Munes, who made himself master of all his baggage, as well as of the plunder he had acquired; and this blow obliged him to fly to Kairwan with the shattered remains of his army, where he remained without making any further attempt on Egypt.

26
His general
Habbafah
invades E-
gypt.27
As does ab-
so his son
Abul Ka-
sem,28
Who is ut-
terly de-
feated by
Munes.

Al Mohdi reigned 24 years; and was succeeded by his son Abul Kasem above mentioned, who then took the surname of *Al Kayem Mohdi*. During his reign we read of nothing remarkable, except the revolt of

one

Barbary.
29
Rebellion
of Yezid.

one Yezid Ebn Condat, a man of mean extraction, but who, having been raised to the dignity of chancellor, found means to raise such a strong party, that the khalif was obliged to shut himself up in the castle of Mohedia. Yezid, being then at the head of a powerful army, soon reduced the capital of Kairwan, the cities of Al Rakkada and Tunis, and several other fortresses. He was no less successful in defeating a considerable number of troops which Al Kayem had raised and sent against him; after which he closely besieged the khalif himself in the castle where he had shut himself up. The siege continued seven months; during which time the place was reduced to such straits, that the khalif must either have surrendered it or been starved, when death put an end to his anxiety in the 12th year of his reign, and 334th of the Hegira.

30
Al Mansur
khalif.

Al Kayem was succeeded by his son Ishmael, who immediately took upon himself the title of *Al Mansur*. This khalif thought proper to conceal the death of his father till he had made the preparations necessary for reducing the rebels. In this he was so successful, that he obliged Yezid to raise the siege of Mohedia the same year; and in the following gave him two great overthrows, obliging him to shut himself up in the fortress of Kothama, or Cutama, where he besieged him in his turn. Yezid defended the place a long time with desperate bravery; but finding the garrison at last obliged to capitulate, he made shift to escape privately. Al Mansur immediately dispatched a body of forces in pursuit of him; who overtook, and brought him back in fetters; but not till after a vigorous defence, in which Yezid received several dangerous wounds, of which he died in prison. After his death, Al Mansur caused his body to be flayed, and his skin stuffed and exposed to public view. Of Al Mansur's exploits in Sicily an account is given under that article. Nothing farther remarkable happened in his African dominions; and he died after a reign of seven years and 16 days, in the 341st of the Hegira.

31
Death of
Yezid.

32
Al Moez
Ledinillah
khalif.

Al Mansur was succeeded by his son Abu Zammin Moad, who assumed the surname of *Al Moez Ledinillah*. He proved a very warlike prince, and maintained a bloody contest with Abdalrahman, khalif of Andalusia; for a particular account of which see the article SPAIN. In the 347th year of the Hegira, beginning March 25th, 958, Al Moez sent a powerful army to the western extremity of Africa, under the command of Abul Hasan Jawhar, one of his slaves, whom he had advanced to the dignity of Vizir. Jawhar first advanced to a city called *Tabart*, which he besieged for some time ineffectually. From thence he marched to Fez, and made the proper disposition for attacking that city. But finding that Ahmed Ebn Becr, the emir of the place, was resolved to defend it to the last, he thought proper to abandon the enterprize. However, having traversed all the tract between that capital and the Atlantic ocean, he again sat down before Fez, and took it by storm the following year.

33
He con-
quers E-
gypt,

But the greatest achievement performed by this khalif was his conquest of Egypt, and the removal of the khalifat to that country. This conquest, though long projected, he did not attempt till the year of the Hegira 358. Having then made all necessary preparations for it, he committed the care of that expedition to a faithful and experienced general called *Giafar* or *Jaa-*

far; but in the mean time, this enterprize did not divert Al Moez from the care of his other conquests, particularly those of Sicily and Sardinia: to the last of which he failed in the year of the Hegira 361, continuing a whole year in it, and leaving the care of his African dominions to an experienced officer named *Yusef Ben Zeiri*. He failed thence the following year for Tripoli in Barbary, where he had not staid long before he received the agreeable news that his general had made himself master of Alexandria. He lost no time, but immediately embarked for it, leaving the government of his old African dominions in the hands of his trusty servant Yusef above mentioned, and arriving safely at that port was received with all the demonstrations of joy. Here he began to lay the foundations of his new Egyptian dynasty, which was to put a final end to the old one of Kairwan after it had continued about 65 years.

Barbary
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Barbe.

34
And trans-
fers the seat
of govern-
ment to
that coun-
try.

Al Moez preserved all his old dominions of Kairwan or Africa Proper. But the ambition or avarice of the governors whom he appointed suffered them to run quickly to a shameful decay; particularly the new and opulent metropolis of Mohedia, on which immense sums had been lavished, as well as labour and care, so as to render it not only one of the richest and stateliest, but one of the strongest cities in the world: so that we may truly say, the wealth and splendor of this once famed, though short-lived state, took their final leave of it with the departure of the khalif Al Moez, seeing the whole maritime tract from the Egyptian confines to the Straits of Gibraltar hath since become the nest of the most odious piratical crew that can be imagined.

Under the article ALGIERS we have given a short account of the erection of a new kingdom in Barbary by Texefien; which, however, is there no farther continued than is necessary for the proper understanding the history of that country. A general history might here be given of the whole country of Barbary; but as that would necessarily occasion repetitions under the articles MOROCCO, TRIPOLI, TUNIS, &c. we must refer to those articles for the historical part, as well as for an account of the climate, inhabitants, &c.

BARBATELLI (Bernardino), otherwise called *Pochetti*, a painter of history, fruit, animals, and flowers, was born at Florence in 1542. He was the disciple of Ridolfo Ghirlandaio at Florence; from whose school he went to Rome, and studied there with such uncommon assiduity, that he was frequently so abstracted, and so absolutely engrossed by the objects of his contemplations, as to forget the necessary refreshments of sleep and food. He was excellent in painting every species of animals, fruit, or flowers; and in those subjects not only imitated, but equalled nature. His touch was free, light, and delicate, and the colouring of his objects inexpressibly true; and, beside his merit in his most usual style of painting, the historical subjects which he designed from sacred or profane authors were much esteemed and admired. He died in 1612.

BARBE, or BARB. See BARB.

BARBE, in the military art. To fire in barbe, means to fire the cannon over the parapet, instead of firing through the embrasures; in which case, the parapet must not be above three feet and a half high.

BARBE, or BARDE, is an old word, denoting the armour of the horses of the ancient knights and soldiers, who

Barbe

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Barbet.

who were accoutred at all points. It is said to have been an armour of iron and leather, wherewith the neck, breast, and shoulders of the horse were covered.

BARBE (St), a town of Biscay in Mexico, near which are rich silver mines. W. Long. 109. 55. N. Lat. 26. 0.

BARBED, in a general sense, bearded like a fish-hook set with barbs; also shaved or trimmed.

BARBED and Crested, in heraldry, an appellation given to the combs and gills of a cock, when particularized for being of a different tincture from the body.

A *barbed cross*, is a cross the extremities whereof are like the barbed irons used for striking of fish.

BARBEL, in ichthyology. See CYPRINUS.

BARBELICOTÆ, an ancient sect of Gnostics, spoken of by Theodoret. Their doctrines were absurd, and their ceremonies too abominable to be repeated.

BARBER, one who makes a trade of shaving or trimming the beards of other men for money. Anciently a lute or viol, or some such musical instrument, was part of the furniture of a barber's shop, which was used then to be frequented by persons above the ordinary level of the people, who resorted to the barber either for the cure of wounds, or to undergo some chirological operations, or, as it was then called, to be *trimmed*, a word that signified either shaving or cutting and curling the hair; these, together with letting blood, were the ancient occupations of the barber-surgeon. As to the other important branch of surgery, the setting of fractured limbs, that was practised by another class of men called *bone-setters*, of whom there are hardly any now remaining. The musical instruments in his shop were for the entertainment of waiting customers; and answered the end of a newspaper, with which at this day those who wait for their turn at the barber's amuse themselves. For the origin of the barber's *pole* see the article APPELLATION.

BARBERINI (Francis), one of the most excellent poets of his age, was born at Barberino in Tuscany, in the year 1264. As his mother was of Florence, he settled in that city; where his profession of the law, but especially the beauty of his poetry, raised him a very considerable character. The greatest part of his works are lost; but that which is intitled the *Precepts of Love*, which is a moral poem calculated to instruct those in their duty who have a regard for glory, virtue, and eternity, has had a better fate. It was published at Rome, adorned with beautiful figures, in 1640, by Frederic Ubaldini: he prefixed the author's life; and, as there are in the poem many words which are grown obsolete, he added a glossary to explain them, which illustrates the sense by the authority of contemporary poets.

BARBERINO, a town of Tuscany in Italy, situated at the foot of the Apennine mountains, in E. Long. 12. 15. N. Lat. 43. 40.

BARBERRY, in botany. See BERBERIS.

BARBESUL (anc. geog.), a town and river of Bætica, and a colony in the resort of the Conventus Gaditanus in Spain: now *Marbella* in Grenada.

BARBET, in natural history, a name given by M. Reaumur, and other of the French writers, to a peculiar species of the worms which feed on the pucerons or aphides. See APHIS.

BARBETS, the name of the inhabitants of several valleys in Piedmont, particularly those of Lucern, Angona, Perusa, and St Martin.

BARBEYRAC (John), was born in Besiers in Lower Languedoc in 1674. He was made professor of law and history at Lufanne in 1710: which he enjoyed for seven years, and during that time was three times rector: in 1717, he was professor of public and private law at Groningen. He translated into French the two celebrated works of Puffendorf, his *Law of Nature and Nations*, and his *Duties of a Man and a Citizen*; to both which he wrote excellent notes, and to the former an introductory preface. He translated also Grotius's treatise *De Jure Belli ac Pacis*, with large and excellent notes; and several of Tillotson's sermons. He wrote a work intitled *Traité de Feu*, 2 vols 8vo.

BARBEZIEUX, a town of Saintonge in France, with the title of a marquise. It hath a manufacture of linen cloth; and lies in W. Long. 0. 5. N. Lat. 45. 23.

BARBICAN, or BARBACAN. See BARBACAN.

BARBIERI (Giovanni Francesco), otherwise called *Guercino de Cento*, an eminent historical painter, was born at Cento, a village not far from Bologna, in 1590. At first he was the disciple of Benedetto Genari; but he afterwards studied for some time in the school of the Caracci, though he did not adopt the manner of that famous academy. He seemed to prefer the style of Caravaggio to that of Guido or Albano, imagining it impossible to imitate nature truly, without the assistance of strong lights and strong shadows; and, from that principle, his light was admitted into his painting room from above. In effect, by the opposition of his strong lights and shadows, he gave such force to his pictures, that few, except those of Caravaggio, can stand near them, and not seem feeble in their effect: however, that manner is censured as not being like nature, because it makes objects appear as if they were seen by candle-light, or by the brightness of a sun-beam, which alone can justify the deepness of his shadowing. The principal attention of Guercino seems to have been fixed on arriving at perfection in colouring; he saw the astonishing effects produced by the colouring of the celebrated Venecian masters; and observed, that notwithstanding any imperfections in regard to grace, correctness, or elegance, the works of those masters were the objects of universal admiration. From which observation, he seems to have devoted his whole study to excel in colouring; as if he were convinced, that few are qualified to discern the elevation of thought, which constitutes the excellence of a composition; few may be touched with the grandeur or beauty of the design, or perhaps have a capacity to examine even the correctness of any part of a painting; and yet every eye, and even every imperfect judge of a picture, may be sensibly affected by the force and beauty of the colouring. His taste of design was natural, easy, and often grand, but without any extraordinary share of elevation, correctness, or elegance. The airs of his heads often want dignity, and his local colours want truth. However, there is great union and harmony in his colours, although his carnations are not very fresh; and in all his works there is a powerful and expressive imitation of life, which will for

Barbets

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Barbieri.

Barbieri

Barca.

for ever render them estimable. Towards the decline of his life, he observed that the clearer and brighter style of Guido and Albano had attracted the admiration of all Europe; and therefore he altered his manner, even against his own judgment. But he apologized for that conduct, by declaring, that in his former time he painted for fame, and to please the judicious; and he now painted to please the ignorant, and enrich himself. He died in 1666.—The most capital performance of Guercino is the history of S. Petronilla, which is considered as one of the ornaments of St Peter's at Rome.

BARBIERI (Paolo Antonio), da Cento, painter of still life and animals, was the brother of Guercino, and born at Cento in 1596. He chose for his subjects fruit, flowers, insects, and animals; which he painted after nature with a lively tint of colour, great tenderness of pencil, and a strong character of truth and life. He died in 1640.

BARBITOS, or BARBITON, an ancient instrument of music, mounted with three, others say seven, strings; much used by Sappho and Alcæus, whence it is also denominated *Lesbion*.

BARBLES, or BARBS, in farriery, the knots or superfluous flesh that grow up in the channels of a horse's mouth; that is, in the intervals that separate the bars, and lie under the tongue. These, which are also called *barbes*, obtain in black cattle as well as horses, and obstruct their eating. For the cure, they cast the beast, take out his tongue, and clip off the barbles with a pair of scissars, or cut them with a sharp knife; others choose to burn them off with a hot iron.

BARBOUR (John), archdeacon of Aberdeen, was esteemed an elegant poet in the reign of David I. He wrote the history of Robert Bruce, in an heroic poem, which is still extant, and which contains many facts and anecdotes omitted by other historians. The latest edition of this book is that of Glasgow, 8vo, printed in the year 1672. It is intitled, "The acts and life of the most victorious conqueror Robert Bruce king of Scotland; wherein also are contained the martial deeds of the valiant princes Edward Bruce, Sir James Dowglass, Earl Thomas Randal, Walter Stewart, and sundry others." In one passage, he calls it a *romance*; but that word was then of good reputation: every body knows that the 'Romance of romances' has been innocently applied to true history, as well as the 'Ballad of ballads' to a sacred song.

BARBUDA, one of the British Caribbee islands, about 20 miles long and 12 broad. It is low land, but fruitful and pretty populous. The inhabitants addict themselves to husbandry, and find always a ready market for their corn and cattle in the sugar islands. Barbuda is the property of the Codrington family, who have great numbers of negroes here as well as in Barbadoes. It lies in W. Long. 61. 3. N. Lat. 18. 5.

BARCA, a large country of Africa, lying on the coasts of the Mediterranean Sea, between the kingdoms of Egypt and Tripoli, extending itself in length from east to west from the 39th to the 46th degree of east longitude, and in breadth from north to south about 30 leagues, as is generally supposed. It is for the most part, especially in the middle, a dry, sandy desert; on which account the Arabs call it *Sahart*, or *Ceyart Barka*, that is, the desert or road of whirlwinds or

hurricanes. It labours almost every where under a great scarcity of water; and except in the neighbourhood of towns and villages, where the ground produces some small quantities of grain, such as millet and some maize, the rest is in a manner quite barren and uncultivated, or, to speak more properly, uncultivable: and even of that small quantity which those few spots produce, the poor inhabitants are obliged to exchange some part with their indigent neighbours, for dates, sheep, and camels, which they stand in greater need of than they, by reason of their great scarcity of grass and other proper food; for want of which, those that are brought to them seldom thrive or live long. In this country stood the famed temple of Jupiter Ammon; and notwithstanding the pleasantness of the spot where it stood, this part of the country is said to have been the most dangerous of any, being surrounded with such quick and burning sands as are very detrimental to travellers; not only as they sink under their feet, but being light, and heated by the rays of the sun, are easily raised by every breath of wind; which, if it chance to be in their faces, almost burns their eyes out, and stifles them for want of breath; or if vehement, often overwhelms whole caravans. Against this temple Cambyses king of Persia dispatched an army of 50,000 men. They set out from Thebes in Upper Egypt, and under the conduct of proper guides reached the city of Oasis, seven days journey from that place: but what was their fate afterwards is uncertain; for they never returned either to Egypt or to their own country. The Ammonians informed Herodotus, that, after the army had entered the sandy desert which lies beyond Oasis, a violent wind began to blow from the south at the time of their dinner, and raised the sand to such a degree, that the whole army was overwhelmed and buried alive.

Concerning the government or commerce of this country we know nothing certain. Most probably the maritime towns are under the protection of the Porte: but whether under the bashaw of Egypt or Tripoli, or whether they have formed themselves into independent states like those of Algiers and Tunis, we cannot say; only we are told that the inhabitants of the maritime towns are more civilized than those that dwell in the inland parts. The first profess Mahometanism, and have imbibed some notions of humanity and justice; whilst the latter, who have neither religion nor any sign of worship among them, are altogether savage and brutish. They are a sort of Arabs, and like them live entirely upon theft and plunder. By them this tract, which before was a continued desert, was first inhabited. At their first coming in, they settled themselves in one of the best places of the country; but as they multiplied, and had frequent wars with one another, the strongest drove the weakest out of the best spots, and sent them to wander in the desert parts, where they live in the most miserable manner, their country hardly affording one single necessary of life. Hence it is that they are said to be the ugliest of all the Arabs: their bodies having scarcely any thing but skin and bone, their faces meagre, with fierce ravenous looks; their garb, which is commonly what they take from the passengers who go through these parts, tattered with long wearing; while the poorest of them have scarce a rag to cover their nakedness. They are most expert and

Barca.

resolute.

Barcalon, **Barcelona.** resolute robbers, that being their chief employment and livelihood; but the travellers in these parts are so few, that the Barcans are often necessitated to make distant excursions into Numidia, Libya, and other southern countries. Those that fall into their hands are made to drink plenty of warm milk: then they hang them up by the feet, and shake them, in order to make them vomit up any money they think they have swallowed; after which, they strip them of all their clothes, even to the last rag: but with all this inhumanity, they commonly spare their life, which is more than the other African robbers do. Yet notwithstanding every artifice they can use, the Barcans are so poor, that they commonly let, pledge, or even sell, their children to the Sicilians and others from whom they have their corn, especially before they set out on any long excursion.

BARCALON an appellation given to the prime minister of the king of Siam. The barcalon has in his department every thing relating to commerce, both at home and abroad. He is likewise superintendant of the king's magazines.

BARCELONA, a handsome, rich, and strong city of Spain, in the province of Catalonia, of which it is the capital. This city was originally founded by Hamilcar Barcas, and from him called *Barcino*. It was reduced by the Romans, and continued subject to them till the kingdom of Spain was over-run by the Goths and Vandals, and afterwards by the Saracens or Moors. In the beginning of the 9th century, Barcelona was in the hands of the Moors, and under the government of one *Zade*. This governor having more than once abused the clemency of Charlemagne, at last irritated Louis king of Aquitaine, and son to Charles, to such a degree, that he gave orders to his generals to invest the city, and not to rise from before it till they had put Zade into his hands. The Moor made a most obstinate resistance, so that the siege lasted many months: at last, finding it impossible to preserve the city much longer, and being destitute of all hopes of relief, he determined, or rather was compelled by the inhabitants, to go to the Christian camp and implore the emperor's mercy; but here he was no sooner arrived than he was arrested and sent prisoner to Charelemagne, who condemned him to perpetual banishment. The people gaining nothing by this expedient, continued to hold out for six weeks longer, when the king of Aquitaine himself took the command of the siege. To him they made a proposal, that if he would allow them to march out and go where they pleased, they would surrender the place. Louis having agreed to this, made his public entry into Barcelona, where he formed a design of extending his father's dominions as far as the Ebro; but being recalled before he could put his design in execution, he appointed one Bera count of Barcelona. The city continued subject to him and his successors, who still enjoyed the title of *counts of Barcelona*, from the year 802 to 1131; during which time we find nothing remarkable, except that the city was once taken by the Moors, but soon after retaken by the assistance of Louis IV. king of France. In 1131 it was united to the crown of Arragon by the marriage of Don Raymond V. count of Barcelona with the daughter of Don Ramiro the Monk, king of Arragon. In 1465 the Catalonians revolted against Don Juan II. king of Ar-

ragon, out of hatred to his queen Donna Juanna; the consequence of which was, that Barcelona was besieged by that monarch in 1471. Various efforts were made by Louis XI. of France and the Duke of Lorraine in order to raise the siege, but without effect. Things at length were brought to the utmost extremity, when the king offered to pardon them all, without the smallest punishment either in person or property, provided they would submit: but these terms they rejected, chiefly through the influence of the Count de Pailhars, who had been pardoned the year before. The army, on the other hand, was very earnest on being led on to the assault, in hopes of plunder. The king, however, wrote a letter to the citizens, dated the 6th of October, in terms as affectionate as if he had been writing to his children, bewailing the miseries they had brought on themselves, and concluding with a protestation that they, and not he, must be answerable for the consequences. Upon this, at the persuasion of a priest who had a reputation for sanctity, they sent deputies to the king, and made a capitulation on the 17th of the same month. In this the king acknowledged they had taken up arms on just motives; and forgave every body except Pailhars, who was, however, suffered to escape. On the 22d of October the king made his entry into the city, and confirmed all their ancient privileges. In 1697, Barcelona was taken by the French, after a bloody siege of 52 days; and the loss of this city had a considerable effect in disposing the Spaniards to agree to the treaty of Ryswick. In Queen Anne's time it was taken by the allies under the earl of Peterborough; but being afterwards shamefully denied assistance by the English ministry, was obliged to submit to Philip V. by whom the whole province was deprived of its ancient privileges; for a particular account of which, see the article **SPAIN**.

Barcelona is situated by the sea-side, of a form between a square and an oval. It is surrounded with a good brick-wall, round which is another, with 14 bastions, horn-works, ramparts, and ditches; the ramparts are high, broad, and spacious, insomuch that 100 coaches may be seen every evening driving thereon for pleasure. The city is divided into two parts, the Old and the New, which are separated from each other by a wall and a large ditch; the streets are handsome, well paved with large stones, wide, and very clean. It is the residence of a viceroy, is a bishop's see, has a fine university, a mint, a good port, and is adorned with handsome buildings. Here is a court of inquisition, which the inhabitants look upon as an advantage. The remarkable buildings are the cathedral, which is large, handsome, and adorned with two high towers, the church of the Virgin Mary, the palace of the bishop, that of the inquisition, and several religious houses: add to these the palace of the viceroy; the arsenal, which contains arms for 1000 men; the exchange, where the merchants meet; the *terfana*, where they build the galleys; and the palace where the nobility of the country meet, called *La Casa de la Deputation*. This last is built with fine large free stone, and adorned with columns of marble: there is in it a large hall, with a gilt ceiling and a handsome portico, wherein persons may either walk or sit; the hall is adorned with the portraits of all the counts of Barcelona. There are several fine squares, particularly that of St Michael,

Barceloneta ^{ta} _{Barclay.} Michael, into which all the great streets run. The port is wide, spacious, deep, and safe; defended on the one side by a great mole, and on the other sheltered from the west wind by two mountains that advance into the sea, and form a kind of promontory: the mole is 750 paces long, with a quay, at the end of which is a light-house and a small fort. One of the mountains, called *Mount Joy*, is very high, and rises in the middle of the plain near the city: it is covered with gardens, vineyards, groves of trees, and has a strong fort for the defence of the city. This mountain, being a rock, yields an unexhaustible quarry of fine hard free stone. Barcelona is a place of great trade, on account of the conveniency of its harbour; and it has a manufacture of knives greatly esteemed in Spain, as also of blankets. Here are also several glass-houses. The inhabitants are diligent, and equally fit for labour and trade; they are also very civil to strangers. The women are well shaped, and as handsome as any in Spain; they are brisk and lively in their conversation, and more free and unrestrained in their behaviour than in other parts of Spain. E. Long. 2. 5. N. Lat. 41. 26.

BARCELONETTA, a town of France in the government of Dauphiny, and capital of the valley of its own name. It belonged to the duke of Savoy, and was ceded to France by the treaty of Utrecht in 1712. E. Long. 6. 40. N. Lat. 44. 26.

BARCELOR, a town of Asia, in the East Indies, on the coast of Malabar. It is a Dutch factory, where they carry on a considerable trade in pepper. E. Long. 74. 15. N. Lat. 13. 45.

BARCELOS, a town of Portugal, with the title of a duchy. It is seated on the river Cavado, over which there is a handsome bridge. W. Long. 7. 0. N. Lat. 41. 20.

BARCINO (anc. geog.), a town of the Terraconensis in Spain, and capital of the Laetani. Now **BARCELONA**. See that article.

BARCLAY (Alexander), a learned monk in the reign of Henry VIII. Where he was born, though of no great importance, was nevertheless a matter of virulent contention among his former biographers. Bale, who was his contemporary, is of opinion he was born in Somersetshire. There is indeed a village of his name, and a numerous family, in that county. Pits thinks he was born in Devonshire. Mackenzie is positive he was a Scotchman. He was, however, educated in Oriel College, Oxford, when Thomas Cornish was provost of that house. After leaving the university he went abroad, and continued some time in France, Italy, and Germany, where he acquired a competent knowledge of the languages of those countries, as appears from several translations of books, which he afterwards published. On his return to England, the provost of Oriel, who had been his patron at college, having been preferred to a bishopric, made him his chaplain; and afterwards appointed him a priest of St Mary, at the college of Ottery in Devonshire, founded by Grandison bishop of Exeter. After the death of his patron, he became a Benedictine monk of Ely. On the dissolution of that monastery, he first obtained the vicarage of St Matthew at Wokey in Somersetshire; and, in 1549, being then doctor of divinity, was presented to the vicarage of Much Badew in Essex. In 1552, he was appointed rector of Allhallows, Lombard-street, which he lived to enjoy but a very

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short time. He died at Croydon in Surrey in June 1552. He is generally allowed to have improved the English language, and to have been one of the politest writers of his time. He composed several original works: but was chiefly remarkable for his translations from the Latin, Italian, French, and German languages. His version from Sallust of the war of Jugurtha is accurate and not without elegance. His lives of several saints, in heroic verse, are still unpublished. His *Stultifera navis*, or *The ship of fools*, is the most singular of his performances. It was printed by Richard Pynson at London, 1509, in folio; and contains a variety of wooden plates, which are worthy the inspection of the curious.

BARCLAY (William), a learned civilian, was born in Aberdeenshire in the year 1541. He spent the early part of his life, and much of his fortune, at the court of Mary Queen of Scots, from whose favour he had reason to expect preferment. In 1573 he went over to France, and at Bourges commenced student of civil law under the famous Cujacius. He continued some years in that seminary, where he took a doctor's degree; and was soon after appointed professor of civil law in the university of Pont-à-Mousson, then first founded by the duke of Lorraine. That prince afterwards made him counsellor of state and master of requests. Barclay, in the year 1581, married Ann de Mallaville, a French lady, by whom he had a son, who became a celebrated author, and of whom the reader will find an account in the next article. This youth the Jesuits would gladly have received into their society. His father refused his consent, and for that reason these disciples of Jesus soon contrived to ruin him with the duke his patron. Barclay now embarked for Britain, where king James I. offered him considerable preferment, provided he would become a member of the church of England: but not choosing to comply, he returned to France in 1604; and, soon after his arrival, was appointed professor of civil law in the university of Angers, where he died the year following, and was buried in the Franciscan church. He was esteemed a learned civilian; and wrote elaborately in defence of the divine right of kings, in answer to Buchanan and others. The titles of his works are, 1. *De regno et regali potestate*, &c. 2. *Commentarius in tit. pandectarum de rebus creditis, et de jurejurando*. 3. *De potestate papæ*, &c. 4. *Premetia in vitam Agricola*.

BARCLAY (John), son of the former, was, as we have abovementioned, so great a favourite of the Jesuits, that they used all their efforts to engage him in their society. His father would not consent, and carried his son with him into England, who was already an author, for he had published *A commentary upon the Thebais of Statius*, and a Latin poem on the coronation of king James, and the first part of *Euphormio*, 1603. He returned to France with his father; and after his father's death went to Paris, and soon after came back to London: he was there in 1606. He published *The History of the Gun-powder Plot*, a pamphlet of six leaves, printed at Amsterdam. He published at London in 1610 *An Apology for the Euphormio*, and his father's treatise *De potestate papæ*. And at Paris, 1612, he published a book intitled *Pietas*, in answer to Cardinal Bellarmine, who had written against William Barclay's

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Barclay's book concerning the power of the Pope. Two years after he published *Icon Animorum*. He was invited to Rome by Pope Paul V. and received a great deal of civility from Cardinal Bellarmine, though he had written against him. He died at Rome in 1621, while his *Argenis* was printing at Paris. This celebrated work has since gone through a great number of editions, and has been translated into most languages. M. de Peirese, who had the care of the first edition, caused the effigies of the author to be placed before the book; and the following distich, written by Grotius, was put under it:

*Gente Caledonius, Gallus natalibus, hic est,
Romam Romano qui docet ore loqui.*

BARCLAY (Robert), one of the most eminent among the Quakers, the son of Colonel David Barclay, descended of the ancient family of Barclays, was born at Edinburgh in 1648. He was educated under an uncle at Paris, where the Papists used all their efforts to draw him over to their religion. He joined the Quakers in 1669, and distinguished himself by his zeal and abilities in defence of their doctrines. In 1676 he published in Latin at Amsterdam his *Apology for the Quakers*; which is the most celebrated of his works, and esteemed the standard of the doctrine of the Quakers. The *Theses Theologicae*, which were the foundation of this work, and addressed to the clergy of what sort soever, were published before the writing of the *Apology*, and printed in Latin, French, High-Dutch, Low-Dutch, and English. The dedication of his *Apology* to King Charles II. is very remarkable for the uncommon frankness and simplicity with which it is written. Amongst many other extraordinary passages, we meet with the following: "There is no king in the world who can so experimentally testify of God's providence and goodness; neither is there any who rules so many free people, so many true Christians; which thing renders thy government more honourable, thyself more considerable, than the accession of many nations filled with slavish and superstitious souls. Thou hast tasted of prosperity and adversity; thou knowest what it is to be banished thy native country, to be over-ruled as well as to rule and sit upon the throne; and being oppressed, thou hast reason to know how hateful the oppressor is both to God and man: if, after all those warnings and advertisements, thou dost not turn unto the Lord with all thy heart, but forget him who remembered thee in thy distress, and give up thyself to follow lust and vanity, surely great will be thy condemnation."—He travelled with the famous Mr William Penn through the greatest part of England, Holland, and Germany, and was every where received with the highest respect; for though both his conversation and behaviour were suitable to his principles, yet there was such liveliness and spirit in his discourse, and such serenity and cheerfulness in his deportment, as rendered him extremely agreeable to all sorts of people. When he returned to his native country he spent the remainder of his life in a quiet and retired manner. He died at his own house at Ury on the 3d of October 1690, in the 42d year of his age.

BARCOCHEBAS, or rather BARCOCHAB, a Jewish impostor, whose real name was *Akibab*; but he took that of *Barcochab*, which signifies the *Son of a*

Star; in allusion to the prophecy of Balaam, "There shall a star arise out of Jacob." He proclaimed himself the Messiah; and talking of nothing but wars, victories, and triumphs, made his countrymen rise against the Romans, by which means he was the author of innumerable disorders: he ravaged many places, took a great number of fortresses, and massacred an infinite multitude of people, particularly the Christians. The emperor sent troops to Rufus, governor of Judea, to suppress the sedition. Rufus, in obedience, exercised a thousand cruelties, but could not finish his attempt. The emperor was therefore obliged to send Julius Severus, the greatest general of that time; who attained his end without a direct battle; he fell on them separately; cut off their provisions; and at last the whole contest was reduced to the siege of Bitter, in the 18th year of Hadrian. The impostor perished there. This war cost the Romans a great deal of blood.

BARD, a word denoting one who was a poet by his genius and profession; and "who sung of the battles of heroes, or the heaving breasts of love." *Offian's Poems*, I. 37.

The curiosity of man is great with respect to the transactions of his own species: and when such transactions are described in verse, accompanied with music, the performance is enchanting. An ear, a voice, skill in instrumental music, and, above all, a poetical genius, are requisite to excel in that complicated art. As such talents are rare, the few that possessed them were highly esteemed; and hence the profession of a bard, which, beside natural talents, required more culture and exercise than any other known art. Bards were capital persons at every festival and at every solemnity. Their songs, which, by recording the achievements of kings and heroes, animated every hearer, must have been the entertainment of every warlike nation. We have Hesiod's authority, that in his time bards were as common as potters or joiners, and as liable to envy. Demodocus is mentioned by Homer as a celebrated bard; and Phemius, another bard, is introduced by him deprecating the wrath of Ulysses in the following words:

"O King! to mercy be thy soul inclin'd,
And spare the poet's ever-gentle kind:
A deed like this thy future fame would wrong,
For dear to gods and men is sacred song.
Self-taught I sing; by heav'n, and heav'n alone,
The genuine seeds of poetry are sown;
And (what the god's bestow) the lofty lay,
To gods alone, and godlike worth, we pay.
Save then the poet, and thyself reward;
'Tis thine to merit, mine is to record."

ODYSSEY, viii.

Cicero reports, that at Roman festivals, anciently, the virtues and exploits of their great men were sung. The same custom prevailed in Peru and Mexico, as we learn from Garcilasso and other authors. We have for our authority Father Gobien, that even the inhabitants of the Marian islands have bards, who are greatly admired, because in their songs are celebrated the feats of their ancestors.

But in no part of the world did the profession of bard appear with such lustre as in Gaul, in Britain, and in Ireland. Wherever the Celtæ or Gauls are mentioned

Bard.

Kaims's
Sketches
Sk. V.
sect. 2.

Bard.
Blair's Dis-
sertation,
subjoined
to Ossian's
Poems,
Vol. II.
p. 306.

* Lib. xv.
c. 9.

De Bel. Gal.
l. 6.

Ossian,
ll. 22.

Henry's
History,
Vol. I.
p. 365.

tioned by ancient writers, we seldom fail to hear of their druids and their bards; the institution of which two orders, was the capital distinction of their manners and policy. The druids were their philosophers and priests; the bards, their poets and recorders of heroic actions: and both these orders of men seem to have subsisted among them, as chief members of the state, from time immemorial. The Celtæ possessed, from very remote ages, a formed system of discipline and manners, which appears to have had a deep and lasting influence. Ammianus Marcellinus * gives them this express testimony, that there flourished among them the study of the most laudable arts; introduced by the bards, whose office it was to sing in heroic verse the gallant actions of illustrious men; and by the druids, who lived together in colleges or societies, after the Pythagorean manner, and philosophizing upon the highest subjects, asserted the immortality of the human soul. Though Julius Cæsar, in his account of Gaul, does not expressly mention the bards, yet it is plain, that, under the title of *Druids*, he comprehends that whole college or order; of which the bards, who, it is probable, were the disciples of the druids, undoubtedly made a part. It deserves remark, that, according to his account, the druidical institution first took rise in Britain, and passed from thence into Gaul; so that they who aspired to be thorough masters of that learning were wont to resort to Britain. He adds too, that such as were to be initiated among the druids, were obliged to commit to their memory a great number of verses, inasmuch that some employed 20 years in this course of education; and that they did not think it lawful to record these poems in writing, but sacredly handed them down by tradition from race to race.

So strong was the attachment of the Celtic nations to their poetry, and their bards, that amidst all the changes of their government and manners, even long after the order of the druids was extinct, and the national religion altered, the bards continued to flourish; not as a set of strolling songsters, like the Greek *ᾠδοὶ* or *rhapsodists*, in Homer's time, but as an order of men highly respected in the state, and supported by a public establishment. We find them, according to the testimonies of Strabo and Diodorus, before the age of Augustus Cæsar; and we find them remaining under the same name, and exercising the same functions as of old, in Ireland, and in the north of Scotland, almost down to our own times. It is well known, that, in both these countries, every *regulus* or chief had his own bard, who was considered as an officer of rank in his court.

Of the honour in which the bards were held, many instances occur in Ossian's poems. On all important occasions, they were the ambassadors between contending chiefs; and their persons were held sacred. "Cair-bor feared to stretch his sword to the bards, though his soul was dark. Loofe the bards (said his brother Cathmor), they are the sons of other times. Their voice shall be heard in other ages, when the kings of Temora have failed."—The bards as well as the druids, were exempted from taxes and military services, even in times of the greatest danger; and when they attended their patrons in the field, to record and celebrate their great actions, they had a guard assigned

them for their protection. At all festivals and public assemblies they were seated near the person of the king or chieftain, and sometimes even above the greatest nobility and chief officers of the court. Nor was the profession of the bards less lucrative than it was honourable. For, besides the valuable presents which they occasionally received from their patrons when they gave them uncommon pleasure by their performances, they had estates in land allotted for their support. Nay, so great was the veneration which the princes of these times entertained for the persons of their poets, and so highly were they charmed and delighted with their tuneful strains, that they sometimes pardoned even their capital crimes for a song.

We may very reasonably suppose, that a profession that was at once so honourable and advantageous, and enjoyed so many flattering distinctions and desirable immunities, would not be deserted. It was indeed very much crowded; and the accounts which we have of the numbers of the bards in some countries, particularly in Ireland, are hardly credible. We often read, in the poems of Ossian, of an hundred bards belonging to one prince, singing and playing in concert for his entertainment. Every chief bard, who was called *Allah Redan*, or *doctor in poetry*, was allowed to have 30 bards of inferior note constantly about his person; and every bard of the second rank was allowed a retinue of 15 poetical disciples.

Though the ancient Britons of the southern parts of this island had originally the same taste and genius for poetry with those of the north, yet none of their poetical compositions of this period have been preserved. Nor have we any reason to be surprised at this: For after the provincial Britons had submitted quietly to the Roman government, yielded up their arms, and had lost their free and martial spirit, they could take little pleasure in hearing or repeating the songs of their bards in honour of the glorious achievements of their brave ancestors. The Romans too, if they did not practise the same barbarous policy which was long after practised by Edward I. of putting the bards to death, would at least discourage them, and discountenance the repetition of their poems, for very obvious reasons. These sons of the song being thus persecuted by their conquerors, and neglected by their countrymen, either abandoned their country or their profession; and their songs being no longer heard, were soon forgotten.

It is probable that the ancient Britons, as well as many other nations of antiquity, had no idea of poems that were made only to be repeated, and not to be sung to the sound of musical instruments. In the first stages of society in all countries, the two sister-arts of poetry and music seem to have been always united; every poet was a musician, and sung his own verses to the sound of some musical instrument. This, we are directly told by two writers of undoubted credit, was the case in Gaul, and consequently in Britain, in this period.

"The bards (says Diodorus Siculus *) sung their poems to the sound of an instrument not unlike a lyre." *Lib. v. sect. 31.*
"The bards (according to Ammianus Marcellinus †, † *Lib. xv. c. 9.* as above hinted) celebrated the brave actions of illustrious men, in heroic poems, which they sung to the sweet sounds of the lyre." This account of these Greek and Latin writers is confirmed by the general

Bard
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Bardefa-
nists.
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4 Vol. II.
p. 112, 113.

Kaim's
Sketches,
ubi supra.

§ See the
article
Attention.

ral strain, and by many particular passages, of the poems of Ossian. "Beneath his own tree, at intervals, each bard sat down with his harp. They raised the song, and touched the string, each to the chief he loved †."

The invention of writing made a considerable change in the bard profession. It is now an agreed point, that no poetry is fit to be accompanied with music but what is simple: a complicated thought or description requires the utmost attention, and leaves none for the music; or, if it divide the attention, it makes but a faint impression §. The simple operas of Quinault bear away the palm from every thing of the kind composed by Boileau or Racine. But when a language, in its progress to maturity, is enriched with variety of phrases fit to express the most elevated thoughts, men of genius aspired to the higher strains of poetry, leaving music and song to the bards: which distinguished the profession of a poet from that of a bard. Homer, in a lax sense, may be termed a bard; for in that character he strolled from feast to feast. But he was not a bard in the original sense: he, indeed, recited his poems to crowded audiences; but his poems are too complex for music, and he probably did not sing them, nor accompany them with the lyre. The Trovadores of Provence were bards in the original sense, and made a capital figure in the days of ignorance, when few could read, and fewer write. In later times, the songs of the bards were taken down in writing, which gave every one access to them without a bard; and the profession sunk by degrees into oblivion. Among the Highlanders of Scotland, reading and writing in their own tongue is not common even at present; and that circumstance supported long the bard-profession among them, after being forgot among the neighbouring nations.

BARDANA, or BURDOCK. See ARCTIUM.

BARDARIOTÆ, in antiquity, were a kind of ancient guard attending the Greek emperors, armed with rods, wherewith they kept off the people from crowding too near the prince when on horseback. Their captain, or commander, was denominated *primi-vergius*.—The word was probably formed from the *barde*, or housings on their horses.

BARDAS, the brother of the empress Theodora, and uncle of the famous Photius, is said to have had no other good quality besides that of loving the sciences and polite literature, which he established in the Eastern empire; for he was treacherous, cruel, and ambitious. In the year 856, he assassinated Theoctistes, general of the Emperor Michael's forces, and obtained his post. At length he caused the disgrace of the empress Theodora; and St Ignatius, patriarch of Constantinople, reproaching him for his vices, he had him deposed in 858, in order to make room for Photius. Bardas was assassinated by Basilus the Macedonian, in 866.

BARDED, in heraldry, is used in speaking of a horse that is caparisoned. He bears sable, a *cavalier d'or*, the horse *barded*, argent.

BARDESANISTS, a sect of ancient heretics, thus denominated from their leader Bardesanes, a Syrian of Edessa in Mesopotamia. Bardesanes, born in the middle of the second century, became eminent, after his conversion to Christianity, for his zeal against

heretics; against whom, we are informed by St Jerome and Eusebius, he wrote a multitude of books: yet had he the misfortune to fall, himself, into the errors of Valentinus, to which he added some others of his own. He taught, that the actions of men depend altogether on fate, and that God himself is subject to necessity. His followers went further, and denied the resurrection of the body, and the incarnation and death of our Saviour; holding that these were only apparent or fantastical.

BARDEWICK, a town of Germany, in the circle of Lower Saxony and duchy of Lunenburg; formerly a very large place: but being ruined in 1189 by the duke of Saxony, has never yet recovered itself. It is seated on the river Ilmenau, in E. Long. 10. 6. N. Lat. 53. 40.

BARDT, a strong and rich town of Germany, in the duchy of Pomerania, with a castle and spacious harbour. It is subject to the Swedes; and is situated near the Baltic Sea, in E. Long. 13. 20. N. Lat. 54. 23.

BARE, in a general sense, signifies *not covered*. Hence we say bare-headed, bare-footed, &c.

The Roman women, in times of public distress and mourning, went *bare-headed*, with their hair loose.—Among both Greeks, Romans, and Barbarians, we find a feast called *Nudipedalia*.—The Abyssinians never enter their churches, nor the palaces of kings and great men, but *bare-footed*.

BARE-FOOT Carmelites and Augustines, are religious of the order of St Carmel and St Austin, who live under a strict observance, and go without shoes, like the capuchins. There are also bare-foot fathers of mercy. Formerly there were bare-foot dominicans, and even bare-foot nuns of the order of St Augustin.

BAREITH, a town of Germany in Franconia, in the margravate of Culembach, with a famous college belonging to the margrave of Brandenburg Bareith. E. Long. 11. 50. N. Lat. 50. 9.

BARENT (Dieric), an excellent painter, was born at Amsterdam, and was the son of a very industrious painter. He studied in Italy, and became the favourite disciple of Titian, with whom he lived a long time; but at length returned to Amsterdam, where he performed many extraordinary pieces. He died in 1582, aged 48.

BARFLEUR, a town of France, in Normandy, on the continent. It was ruined, and had its harbour filled up by the English in 1346. The cape of that name is 12 miles east of Cherbourg, and near it part of the French fleet was destroyed in 1692. W. Long. 1. 6. N. Lat. 49. 40.

BARGAIN and SALE, a species of conveyance in the English law. It is a kind of a real contract, whereby the bargainer for some pecuniary consideration bargains and sells, that is, contracts to convey, the land of the bargainee; and becomes by such bargain a trustee for, or seized to the use of, the bargainee; and then the statute of uses completes the purchase; or, as it hath been well expressed, the bargain first vests the use, and then the statute vests the possession. But as it was foreseen that conveyances, thus made, would want all those benefits of notoriety which the old common-law assurances were calculated to give; to prevent therefore clandestine conveyances of freeholds, it

Bardewick
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Bargain.

Barge
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Bari.

was enacted in the same session of parliament by statute 27 Hen. VIII. c. 16. that such bargains and sales should not enure to pass a freehold, unless the same be made by indenture, and enrolled within six months in one of the courts of Westminster-hall, or with the *custos rotulorum* of the county. Clandestine bargains and sales of chattel interests, or leases for years, were thought not worth regarding, as such interests were very precarious till about six years before; which also occasioned them to be overlooked in framing the statute of uses: and therefore such bargains and sales are not directed to be enrolled. But how impossible is it to foresee, and provide against, all the consequences of innovations! This omission has given rise to the species of conveyance by LEASE and RELEASE.

BARGE (*bargie*, Dutch), a vessel or boat of state, furnished with elegant apartments, canopies, and cushions; equipped with a band of rowers, and decorated with flags and streamers: they are generally used for processions on the water, by noblemen, officers of state, or magistrates of great cities. Of this sort, too, we may naturally suppose the famous barge or galley of Cleopatra, which, according to Shakespear,

————— Like a burnish'd throne,
Burnt on the water: the poop was beaten gold:
Purple her sails; and so perfumed, that
The winds were love-sick with them: the oars were silver,
Which to the tune of flutes kept time, and made
The water which they beat to follow faster,
As amorous of their strokes. ———

————— At the helm
A seeming mermaid steer'd: the silken tackles
Swell'd with the touches of those flower-soft hands
That yarely 'forn'd their office. ———

There are likewise other barges of a smaller kind, for the use of admirals and captains of ships of war. These are of a lighter frame, and may be easily hoisted into and out of the ships to which they occasionally belong.

BARGE is also the name of a flat-bottomed vessel of burden, for lading and discharging ships, and removing their cargoes from place to place in a harbour.

BARGE-Couples, in architecture, a beam mortised into another, to strengthen the building.

BARGE-Course, with bricklayers, a term used for that part of the tiling which projects over without the principal rafters, in all sorts of buildings where there is either a gable or a kirkin-head.

BARGHMASTER, **BARMER**, or **BAR-MASTER**, in the royal mines, the steward or judge of the barmote. —The bar-master is to keep two great courts of barmote yearly; and every week a small one, as occasion requires.

BARGHMOTE, or **BARMOTE**, a court which takes cognizance of causes and disputes between miners. —By the custom of the mines, no person is to sue any miner for ore-debt, or for ore, or for any ground in variance, but only in the court of barmote, on penalty of forfeiting the debt, and paying the charges at law.

BARI, a very handsome and rich town of Italy, in the kingdom of Naples; the capital of Terra di Bari, and an archbishop's see. It is well fortified, is seated on the Gulph of Venice, and had formerly a good har-

bour, but it was destroyed by the Venetians. E. Long. 17. 40. N. Lat. 41. 31.

BARI, or *Terra di Bari*, a territory of Italy, in the kingdom of Naples, of which the abovementioned city is the capital. It is bounded on the north by the Capitanata, on the north-west by the Ulterior Principato, on the south by the Basilicata, on the south-east by the Terra de Otranto, and on the north-east by the Gulph of Venice. It has no considerable river except the Ofanto, which separates it from the Capitanata. The air is temperate; and the soil produces plenty of corn, fruit, and saffron: but there are a great many serpents, and spiders called *tarantulas*. See **ARANEA**. The principal towns are Bari the capital, Frani, Andria, Bavo, Bilonto, Conversano, Monopoli, Polignano, Barletta, and Malfetto. The two first are archiepiscopal, and all the rest episcopal.

BARILLA, or **BARILHA**, the name of a plant cultivated in Spain for its ashes, from which the purest kinds of mineral alkali are obtained.

There are four plants, which, in the early part of their growth, bear so strong a resemblance to each other as would deceive any but the farmers and nice observers. These four are, *barilla*, *gazul*, (or, as some call it, *algazul*), *soza*, and *salicornia* or *salicor*. They are all burnt to ashes; but applied to different uses, as being possessed of different qualities. Some of the roguish farmers mix more or less of the three last with the first; and it requires a complete knowledge of the colour, taste, and smell of the ashes to be able to detect their knavery.

Barilla is sown afresh every year. Its greatest height above ground is four inches: each root pushes out a vast number of little stalks, which again are subdivided into smaller sprigs resembling samphire; and all together form a large spreading tufted bush. The colour is bright green; as the plant advances towards maturity, this colour vanishes away till it comes at last to be a dull green tinged with brown.

Gazul bears the greatest affinity to *barilla*, both in quality and appearance: the principal difference consists in its growing on a still drier saltier earth, consequently it is impregnated with a stronger salt. It does not rise above two inches out of the ground, spreading out into little tufts. Its sprigs are much flatter and more pulpy than those of *barilla*, and are still more like samphire. It is sown but once in three, four, or five years, according to the nature of the soil.

Soza, when of the same size, has the same appearance as *gazul*; but in time grows much larger, as its natural soil is a strong salt marsh, where it is to be found in large tufts of sprigs, treble the size of *barilla*, and of a bright green colour, which it retains to the last.

Salicor has a stalk of a deep green colour inclining to red, which last becomes by degrees the colour of the whole plant. From the beginning it grows upright, and much resembles a bush of young rosemary. Its natural soil is on the declivities of hills near the salt marshes, or on the edges of the small drains or channels cut by the husbandmen for the purpose of watering the fields; before it has acquired its full growth it is very like the *barilla* of those seasons in which the ground has been dunged before sowing. In those years

Bari
Barilla.

Barilla
||
Bark.

years of manuring, barilla, contrary to its usual nature, comes up with a tinge of red; and when burnt falls far short of its wonted goodness, being bitter, more impregnated with salts than it should be, and raising a blister if applied for a few minutes to the tongue. Barilla contains less salt than the others: when burnt, it runs into a mass resembling a spongy stone, with a faint cast of blue.

Gazul, after burning, comes as near barilla in its outward appearance as it does while growing in its vegetable form; but if broken, the inside is of a deeper and more glossy blue. Soza and salicor are darker and almost black within, of a heavier consistence, with very little or no sign of sponginess.

All these ashes contain a strong alkali; but barilla the best and purest, though not in the greatest quantity. Upon this principle, it is fittest for making glass and bleaching linen; the others are used in making soap. Each of them would whiten linen; but all, except barilla, would burn it. A good crop of barilla impoverishes the land to such a degree, that it cannot bear good barilla a second time, being quite exhausted. For this reason the richer farmers lay manure upon the ground, and let it lie fallow for a season; at the end of which it is sown afresh without any danger, as the weeds that have sprung up in the year of rest have carried off all the pernicious effects of the dung. A proper succession of crops is thus secured by manuring and fallowing the different parts of the farm, each in their turn. The poorer tribe of cultivators cannot pursue the same method for want of capital; and are therefore under the necessity of sowing their lands immediately after manuring, which yields them a profit just sufficient to afford a present scanty subsistence, though the quality and price of their barilla be but trifling.

The method used in making barilla is the same as that followed in Britain in burning kelp. The plant as soon as ripe is plucked up and laid in heaps, then set on fire. The salt juices run out below into a hole made in the ground, where they run into a vitrified lump, which is left about a fortnight to cool. An acre may give about a tun.

BARING OF TREES, in agriculture, the taking away some of the earth about the roots, that the winter-rain and snow-water may penetrate farther into the roots. This is frequently practised in the autumn.

BARJOLS, a small populous town of Provence, in France. E. Long. 5. 23. N. Lat. 43. 35.

BARIUM, (anc. geog.) a town of Apulia on the Adriatic; so called from the founders, who being expelled from the island Bara, built this town. It is now called BARI; see that article.

BARK, in the anatomy of plants, the exterior part of trees, corresponding to the skin of an animal. For its organization, texture, &c. see the article PLANTS.

As animals are furnished with a panniculus adiposus, usually replete with fat, which invests and covers all the fleshy parts, and screens them from external

cold; plants are encompassed with a bark replete with fatty juices, by means whereof the cold is kept out, and in winter-time the spiculae of ice prevented from fixing and freezing the juices in the vessels; whence it is, that some sorts of trees remain ever-green the year round, by reason their barks contain more oil than can be spent and exhaled by the sun, &c.

The bark has its peculiar diseases, and is infected with insects peculiar to it.—It appears from the experiments of M. Buffon, that trees stripped of their bark the whole length of their stems, die in about three or four years. But it is very remarkable, that trees thus stripped in the time of the sap, and suffered to die, afford timber heavier, more uniformly dense, stronger, and fitter for service, than if the trees had been cut down in their healthy state. Something of a like nature has been observed by Vitruvius and Evylyn.

The ancients wrote their books on bark, especially of the ash and lime-tree, not on the exterior, but on the inner and finer bark called *philyra*.

There are a great many kinds of barks in use in the several arts. Some in agriculture, and in tanning leather, as the oak-bark (A); some in physic, as the *quinquina* or Jesuit's bark, mace, &c.; others in dyeing, as the bark of alder, and walnut-trees; others in spicery, as cinnamon, cassia lignea, &c.; and others for divers uses, as the bark of the cork-tree, &c.

In the East Indies, they prepare the bark of a certain tree so as to spin like hemp. After it has been beat and steeped in water, they extract long threads from it, which are something between silk and common thread; being neither so soft nor so glossy as silk, nor so rough and hard as hemp. They mix silk with it in some stuffs; and these are called *nillaes* and *cherquemolles*.

Of the bark of a species of mulberry-tree the Japanese make their paper. See MORUS.

In the island of O-Taheite, the natives make their cloth, which is of three kinds, of the bark of three different trees; the paper mulberry above-mentioned, the bread-fruit tree, and the cocoa tree. That made of the mulberry is the finest and whitest, and worn chiefly by the principal people. It is manufactured in the following manner. When the trees are of a proper size, they are drawn up, and stripped of their branches; after which, the roots and tops are cut off; the bark of these rods being then slit up longitudinally, is easily drawn off; and, when a proper quantity has been procured, it is carried down to some running water, in which it is deposited to soak, and secured from floating away by heavy stones: when it is supposed to be sufficiently softened, the women servants go down to the brook, and, stripping themselves, sit down in the water, to separate the inner bark from the green part on the outside: to do this, they place the under side upon a flat smooth board, and with a kind of shell scrape it very carefully, dipping it continually in the water till nothing remains but the fine fibres of the inner coat. Being thus prepared in the afternoon, they are spread

(A) The bark of the oak has been long used in tanning leather, and even thought essential to that operation; but a different substance has been lately discovered, which answers the purpose full as well, and may be procured at a much cheaper rate; we mean oak saw-dust, or the chips of oak reduced to powder. This valuable secret was purchased by the society for the encouragement of arts, &c.

Bark.

spread out upon plantain leaves in the evening; they are placed in lengths of about 11 or 12 yards, one by the side of another, till they are about a foot broad, and two or three layers are also laid one upon the other: care is taken that the cloth shall be in all parts of an equal thickness, so that if the bark happens to be thinner in any one particular part of one layer than the rest, a piece that is somewhat thicker is picked out to be laid over in the next. In this state it remains till the morning, when great part of the water which it contained when it was laid out is either drained off or evaporated, and the several fibres adhere together, so as that the whole may be raised from the ground in one piece. It is then taken away, and laid upon the smooth side of a long piece of wood prepared for the purpose, and beaten by the women servants. The instrument used for this purpose is a square wooden club, having each of its four sides or faces marked, lengthwise, with small grooves, or furrows, of different degrees of fineness; those on one side being of a width and depth sufficient to receive a small pack-thread, and the others finer in a regular gradation, so that the last are not more than equal to sewing silk. They beat it first with the coarsest side of this mallet, keeping time like our smiths; it spreads very fast under the strokes, chiefly however in the breadth, and the grooves in the mallet mark it with the appearance of threads; it is successively beaten with the other sides, last with the finest, and is then fit for use. Of this cloth there are several sorts, of different degrees of fineness, in proportion as it is more or less beaten. The other cloth also differs in proportion as it is beaten; but they differ from each other in consequence of the different materials of which they are made. The bark of the breadfruit is not taken till the trees are considerably longer and thicker than those of the mulberry; the process afterwards is the same.—Of the bark, too, of a tree which they call *poerou**, they manufacture excellent matting; both a coarse sort which serves them to sleep upon, and a finer to wear in wet weather. Of the same bark they also make ropes and lines, from the thickness of an inch to the size of a small pack-thread.

* *Hibiscus*
tiliaceus of
Linnaeus.

BARK, or *Jesuit's Bark*, is a name given by way of eminence to the quinquina, or cinchona. See CINCHONA.

BARK, in navigation, a general name given to small ships; it is, however, peculiarly appropriated by seamen to those which carry three masts without a mizen top-sail. Our northern mariners, who are trained in the coal-trade, apply this distinction to a broad-sterned ship which carries no ornamental figure on the stern or prow.

Water-BARKS, are little vessels used in Holland for the carriage of fresh water to places where it is wanting, as well as for the fetching sea-water to make salt of. They have a deck, and are filled with water up to the deck.

BARK-Binding, a distemper incident to trees; cured by splitting the bark, or cutting along the grain.

BARK-Galling, is when the trees are galled with thorns, &c. It is cured by binding clay on the galled places.

BARK-Longue, or *Barca Longa*, a small low sharp-built, but very long, vessel without a deck. It goes with sails and oars, and is very common in Spain.

BARKHAMSTEAD, or **BERHAMSTEAD**, a town of Hertfordshire in England; formerly of more note than at present. It had formerly a strong castle built by the Normans, but it has been long since demolished. W. Long. 0. 35. N. Lat. 45. 49.

BARKING, a town of Essex in England, seated on the river Roding, not far from the Thames, in a very unwholesome air. It has been chiefly noted for a large monastery, now in ruins; there being nothing left standing but a small part of the walls and a gate-house. E. Long. 0. 13. N. Lat. 51. 30.

BARKING of Trees, the peeling off the rind or bark. This must be done, in our climate, in the month of May, because at that time the sap of the tree separates the bark from the wood. It would be very difficult to perform it at any other time of the year, unless the season was extremely wet and rainy; for heat and dryness are a very great hindrance to it.

By the French laws, all dealers are forbid to bark their wood while growing on the penalty of 500 livres. This law was the result of ignorance; it being now found, that barking of trees, and letting them die, increases the strength of timber.

BARKLEY, a town of Gloucestershire in England, seated on a branch of the river Severn. It was formerly of some note for a nunnery, and has still the title of a barony. W. Long. 2. 30. N. Lat. 51. 40.

BARKWAY, a town of Hertfordshire in England, on the great road from London to York. W. Long. 0. 5. N. Lat. 52. 0.

BARLÆUS (Gaspar), professor of philosophy at Amsterdam, and one of the best Latin poets of the 17th century. There was scarce any thing great that happened in the world, while he lived, but he made a pompous elegy upon it, when reasons of state were no obstacle to it. He was a great defender of Arminius; and showed his abilities in history by his relation of what passed in Brasil during the government of count Maurice of Nassau, published 1647. He died the year after.

BARLERIA, SNAP-DRAGON: A genus of the angiospermia order, belonging to the didynamia class of plants; and in the natural method ranking under the 40th order, *Personate*. The calyx is quadripartite; two of the stamina are much less than the rest; the capsule is quadrangular, bilocular, bivalved, elastic, and without claws; and the seeds are two. There are ten species; all natives of the warm parts of America, and therefore require to be kept in a stove and treated like other tender exotics. They possess no great beauty nor any remarkable property; but are kept for the sake of variety.

BARLETTA, a handsome and strong town of Italy, in the kingdom of Naples, and in the Terra di Bari, with a bishop's see. It is situated on the gulph of Venice, in E. Long. 16. 32. N. Lat. 41. 30.

BARLEY, in botany. See HORDEUM; and AGRICULTURE, n° 139.

The principal use of barley among us is for making beer; in order to which it is first malted. See the article BEER.

The Spaniards, among whom malt liquors are little known, feed their horses with barley as we do with oats. In Scotland, barley is a common ingredient in broths; and the consumpt of it for that purpose is very

Barkham-
stead
||
Barley.

Barley,
Barlow.

very considerable, *barley-broth* being a dish as frequent there as that of *soup* in France.

Pearl BARLEY, and *French BARLEY*; barley freed of the husk by a mill; the distinction between the two being, that the pearl barley is reduced to the size of small shot, all but the very heart of the grain being ground away.

BARLEY-Water, is a decoction of either of these, reputed soft and lubricating, of frequent use in physic. This well-known decoction is a very useful drink in many disorders; and is recommended, with nitre, by some authors of reputation, in slow fevers.

BARLEY-Corn is used to denote a long measure, containing in length the third part of an inch, and in breadth the eighth. The French carpenters also use barley-corn, *grain d'orge*, as equivalent to a line, or the twelfth part of an inch.

BARLEY-Corn (*grain d'orge*), is also used in building for a little cavity between the mouldings of joiners work, serving to separate or keep them asunder; thus called because made with a kind of plane of the same name.

BARLOW (William), bishop of Chichester, descended of an ancient family in Wales, was born in the county of Essex. In his youth he favoured the reformation; and travelled to Germany to be instructed by Luther, and other preachers of the new doctrine. How long he continued a Protestant is uncertain: but from his letter to King Henry VIII. quoted below, it appears that he wrote several books against the church of Rome. However, he was a regular canon in the Augustine monastery of St Osith in the county of Essex, and studied some time at Oxford with the brothers of that order, where he took the degree of doctor in divinity. He was then made prior of the convent at Bisham in Berkshire; and afterwards succeeded to the several priories of Blackmore, Typtree, Lega, Bromhole, and Haverford-west. On the dissolution of abbeyes, he resigned not only with a good grace, but persuaded several other abbots to follow his example. King Henry was so pleased with his ready obedience on this occasion, that he sent him, in 1535, on an embassy to Scotland; in the same year, made him bishop of St Asaph; in two months after translated him to the see of St David's, and in 1547 to that of Bath and Wells. During this time, our good bishop, as appears from the following epistle to the king, was, or pretended to be, a staunch Papist: it was written in 1533. "Prayse be to God, who of his infynyte
"goodness and mercy inestimable hath brought me
"out of darkness into light, and from deadly ignorance into the quick knowledge of the truth. From
"the whiche, through the fiend's instigation and false
"persuasion, I have greatly swerved.—In so much
"that I have made certayn booke and have suffered
"them to be emprinted, as the tretise of the *buryall*
"of the *masse*, &c. In these tretises I perceive and
"acknowledge myself grievously to have erred, namely
"against the blessed sacrament of the altare; disallowing the *masse* and denying purgatory, with
"slandrous infamy of the pope and my lord cardinal,
"and outrageous raylying against the clergy; which
"I have forsaken and utterly renounced—Asks pardon, *William Barlow*." However, when Edward VI.

came to the crown he was again a Protestant; and for that reason, on Queen Mary's accession, was deprived of his bishopric, and sent prisoner to the fleet, where he continued some time. At length he found means to escape, and immediately joined the other English Protestants in Germany. When Queen Elizabeth ascended the throne, our prelate was raised to the see of Chichester, and soon after made first prebendary of the collegiate church of Westminster. He died in 1568, and was buried in the cathedral at Chichester. He had five daughters, each of which married a bishop. He wrote, 1. *The buryall of the masse*. 2. *The climbing up of fryers and religious persons portred with figures*. 3. *Christian homilies*. 4. *A booke upon Cosmography*. 5. *The godly and pious institution of a Christian man, commonly called the bishop's booke*; and several other works. He is said to be the translator of the Apocrypha as far as the book of Wisdom. His letters to M. Parker are in manuscript in Corpus Christi college Cambridge, Misc. i. 445.

BARLOW (William), a mathematician and divine, the son of the bishop of Chichester, was born in Pembroke-shire whilst his father was bishop of St David's. In 1560, he was entered commoner of Baliol college in Oxford; and in 1564, took a degree in arts, which having completed by determination, he left the university and went to sea; but in what capacity is uncertain: however, he acquired considerable knowledge in the art of navigation. About the year 1573, he entered into orders; and became prebendary of Winchester, and rector of Easton near that city. In 1588, he was made prebendary of Litchfield, which he exchanged for the place of treasurer of that church. Some years after, he was made chaplain to Prince Henry the son of King James I.; and in 1614, archdeacon of Salisbury. He was the first writer on the nature and properties of the magnet. Barlow died in the year 1625, and was buried in the church at Easton. His works are, 1. *The navigator's supply, containing many things of principal importance belonging to navigation, and use of diverse instruments framed chiefly for that purpose*. Lond. 1597, 4to. Dedicated to Robert Earl of Essex. 2. *Magnetical advertisements, or diverse pertinent observations and approved experiments concerning the nature and properties of the loadstone*. Lond. 1616, 4to. 3. *A brief discovery of the idle animadversions of Mark Ridley, M. D. upon a treatise entitled Magnetical advertisements*. Lond. 1618, 4to.

BARLOW (Thomas), born in 1607, was appointed fellow of Queen's college in Oxford in 1633; and two years after was chosen reader of metaphysics to the university. He was keeper of the Bodleian library, and in 1657 was chosen provost of Queen's college. After the restoration of King Charles II. he was nominated one of the commissioners for restoring the members unjustly expelled in 1648. He wrote at that time *The case of Toleration in matters of religion*, to Mr R. Boyle. In 1675, he was made bishop of Lincoln. After the popish plot, he published several tracts against the Roman-catholic religion; in which he shows an uncommon extent of learning and skill in polemical divinity. Nevertheless, when the Duke of York was proclaimed king, he took all opportunities of expressing his affection toward him; but after the revolution he as readily voted

Barlow.

Barlow
||
Bartmas.

voted that the king had abdicated his kingdom: and was very vigorous in excluding those of the clergy who refused the oaths, from their benefices.

Mr Granger observes, that "this learned prelate, whom nature designed for a scholar, and who acted in conformity with the bent of nature, was perhaps as great a master of the learned languages, and of the works of the celebrated authors who have written in those languages, as any man of his age. The greatest part of his writings, of which Mr Wood has given us a catalogue, are against Popery; and his conduct for some time, like that of other Calvinists, appeared to be in direct opposition to the church of Rome. But after James ascended the throne, he seemed to approach much nearer to Popery than he ever did before. He sent the king an address of thanks for his declaration for liberty of conscience, and is said to have written reasons for reading that declaration. His compliances were much the same after the revolution. His moderation, to call it by the softest name, was very great; indeed so great as to bring the firmness of his character in question. But casuistry, which was his most distinguished talent, not only reconciles seeming contradictions, but has also been known to admit contradictions themselves. He was, abstracted from this laxity of principles, a very great and worthy man." He died at Buckden, in Huntingdonshire, on the 8th of October 1691, in the 85th year of his age.

BARLOW (Francis), an English painter, was born in Lincolnshire. On his coming to London, he was placed with one Shephard a limner; but his genius led him chiefly to drawing of birds, fish, and other animals. There are six books of animals from his drawings, and he painted some ceilings with birds for noblemen and gentlemen in the country.—His etchings are numerous; his illustration of Esop is his greatest work. He died in 1702.—There is something pleasing in the composition and manner of this master, though neither is excellent. His drawing too is very indifferent; nor does he characterize any animal justly. His birds in general are better than his beasts.

BARM, the same with yest. See YEST.—Barm is said to have been first used by the Celtæ in the composition of bread. About the time of Agricola's entrance into Lancashire, a new sort of loaf had been introduced at Rome; which was formed only of water and flour, and much esteemed for its lightness: and it was called the *water cake* from its simple composition, and the *Parthian roll* from its original inventors. But even this was not comparable to the French or Spanish bread for its lightness. The use of curmi*, and the knowledge of brewing, had acquainted the Celtes with an ingredient for their bread, which was much better calculated to render it light and pleasant, than the leaven, the eggs, the milk, or the wine and honey, of other nations. This was the spume which arose on the surface of their curw in fermentation, and which the Welch denominate *burm*, and we *barm*. The Celtes of Gaul, of Spain, and most probably therefore of South-Britain, had long used it; and their bread was, in consequence of this, superior in lightness to that of any other nation in the world†. See the articles BAKING and BREAD.

BARMAS, an East Indian people, who in 1515

possessed all the coast extending from Bengal to Pegu. It appears also, that they were formerly masters of Ava, the dominions of which extended as far as China; and of consequence the Barmas were masters of most of the northern part of the peninsula beyond the Ganges. Their dominions, however, were afterwards reduced to very narrow bounds, and their king became tributary to him of Pegu; but by degrees they not only recovered their former empire, but conquered the kingdoms of Pegu, Siam, and several other. By the latest accounts, their kingdom extends from the province of Yun-nan in China, about 800 miles in length from north to south, and 250 in breadth from east to west. See the article PEGU.

BARN, in husbandry, a covered place or house, with air-holes in the sides, for laying up any sort of grain, hay, or straw.

St BARNABAS'S DAY, a Christian festival, celebrated on the 11th of June.—St Barnabas was born at Cyprus, and descended of the tribe of Levi, whose Jewish ancestors are thought to have retired thither to secure themselves from violence during the troublesome times in Judea. His proper name was *Joses*; to which, after his conversion to Christianity, the apostles added that of *Barnabas*, signifying either *the son of prophecy*, or *the son of consolation*; the first respecting his eminent prophetic gifts, the other his great charity in selling his estate for the comfort and relief of the poor Christians. He was educated at Jerusalem, under the great Jewish doctor Gamaliel; which might probably lay the foundation of that intimate friendship which was afterwards contracted between this apostle and St Paul. The time of his conversion is uncertain; but he is generally esteemed one of the seventy disciples chosen by our Saviour himself.

At Antioch, St Paul and St Barnabas had a contest, which ended in their separation: but what followed it with respect to St Barnabas is not related in the *Acts of the Apostles*. Some say, he went into Italy, and founded a church at Milan. At Salamis, we are told, he suffered martyrdom; whither some Jews, being come out of Syria, set upon him, as he was disputing in the synagogue, and stoned him to death. He was buried, by his kinsman Mark, whom he had taken with him, in a cave near that city. The remains of his body are said to have been discovered in the reign of the emperor Zeno, together with a copy of St Matthew's gospel, written with his own hand, and lying on his breast.

St BARNABAS'S *Epistle*, an apocryphal work ascribed to St Barnabas, and frequently cited by St Clement of Alexandria and Origen.—It was first published in Greek, from a copy of father Hugh Menard a Benedictine monk. An ancient version of it was found in a manuscript of the abbey of Coebey, near a thousand years old. Vossius published it, in the year 1656, together with the epistles of St Ignatius.

St BARNABAS'S *Gospel*, another apocryphal work, ascribed to St Barnabas the apostle, wherein the history of Jesus Christ is related in a manner very different from the account given us by the four Evangelists. The Mahometans have this gospel in Arabic, and it corresponds very well with those traditions which Mahomet followed in his Koran. It was, probably, a forgery of some nominal Christians; and afterwards altered

Barn
Barnabas.

* See Ale.

† Pliny, lib. xviii. c. 7, 21.

Barnabites altered and interpolated by the Mahometans, the better to serve their purpose.

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Barnes.

BARNABITES, a religious order, founded in the 16th century by three Italian gentlemen, who had been advised by a famous preacher of those days to read carefully the epistles of St Paul. Hence they were called *clerks of St Paul*; and *Barnabites*, because they performed their first exercise in a church of St Barnabas at Milan. Their habit is black; and their office is to instruct, catechise, and serve in mission.

BARNACLE, in ornithology, a species of goose. See *ANAS*.

BARNACLES, in farriery, an instrument composed of two branches joined at one end with a hinge, to put upon horses noses when they will not stand quietly to be shod, blooded, or dressed.

BARNADESIA, in botany: A genus of the polygamia æqualis order, belonging to the syngenesia class of plants; the characters of which are: The corolla is radiated; the calyx is naked, imbricated, and pungent; the pappus of the rays feathery, of the disk bristly and retrofracted. There is but one species, the *spinosa*, a native of America.

BARNARD, or **BERNARD** (John), the son of John Barnard, gent. was born at Castor in Lincolnshire, and educated at Cambridge. After several preferments, he was made a prebendary of the church of Lincoln. He wrote *Censura Clericorum*, against scandalous ministers not fit to be restored to church livings; the *Life of Dr Heylyn*; and a few other works. He died at Newark, August 17. 1683.

BARNARD-Castle, seated on the river Tees in the county of Durham, is a town and barony belonging to Vane earl of Darlington. It is indifferently large, and has a manufacture of stockings. W. Long. 1. 45. N. Lat. 54. 35.

BARNES (Joshua), professor of the Greek language at Cambridge, in the beginning of the 18th century. He was chosen queen's professor of Greek in 1695, a language he wrote and spoke with the utmost facility. His first publication was a whimsical tract, intitled, *Gerania, or a new Discovery of the little sort of people called Pygmies*. After that appeared his *Life of Edward III.* in which he introduces his hero making long and elaborate speeches.—In the year 1700, when he published many of his works, Mrs Mason, of Hemmingford, in Huntingdonshire, a widow lady of between 40 and 50, with a jointure of L. 200 *per annum*, who had been for some time a great admirer of him, came to Cambridge, and desired leave to settle L. 100 a-year upon him after her death; which he politely refused, unless she would likewise condescend to make him happy with her person, which was not very engaging. The lady was too obliging to refuse any thing to Joshua, for whom she said, “the sun stood still;” and they were accordingly married. Mr Barnes wrote several other books besides those above mentioned, particularly, *Sacred Poems*; *The Life of Oliver Cromwell, the Tyrant*; *several dramatic pieces*; a *poetical Paraphrase on the History of Esther, in Greek verse*, with a Latin translation, &c.; and he published editions of *Euripides*, *Anacreon*, and *Homer's Iliad and Odyssey*, with notes and a Latin translation. He wrote with greater ease in Greek than even in English, and yet is generally allowed not to have understood the delicacies of that language. He was of such a humane disposi-

tion, and so unacquainted with the world, that he gave Barnavelde his only coat to a vagrant begging at his door. This excellent man died on the 3d of August 1712, in the 58th year of his age.

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Barocci.

BARNAVELDT (John d' Olden), the celebrated Dutch statesman, and one of the founders of the civil liberty of Holland. His patriotic zeal inducing him to limit the authority of Maurice prince of Orange the second stadtholder of Holland, the partizans of that prince falsely accused him of a design to deliver his country into the hands of the Spanish monarch. On this absurd charge he was tried by 26 commissaries deputed from the seven provinces, condemned, and beheaded in 1619. His sons William and René, with a view of revenging their father's death, formed a conspiracy against the stadtholder, which was discovered. William fled: but René was taken and condemned to die; which fatal circumstance has immortalized the memory of his mother, of whom the following anecdote is recorded. She solicited a pardon for René; upon which Maurice expressed his surprise that she should do that for her son which she had refused for her husband. To this remark, she replied with indignation, “I would not ask a pardon for my husband, because he was innocent. I solicit it for my son, because he is guilty.”

BARNET, a town partly in Middlesex and partly in Hertfordshire. It is a great thorough-fair, and the market is very remarkable for hogs. W. Long. 0. 5. N. Lat. 51. 42.

BARNSLEY, or **BLACK BARNSLEY**, a town of the west riding of Yorkshire, seated on the side of a hill, and five furlongs in length. W. Long. 1. 20. N. Lat. 53. 35.

BARNSTABLE, a sea-port town of Devonshire, seated on the river Tau, over which there is a good bridge. It is a corporation town, and sends two members to parliament. W. Long. 4. 5. N. Lat. 51. 15.

BARO, or **BARON** (Peter), professor of divinity in the university of Cambridge, in the 16th century, was born an Estampes in France, and educated in the university of Bourges, where he was admitted a licentiate in the law: but being of the Protestant religion, he was obliged to leave his native country to avoid persecution; and withdrawing into England, was kindly entertained by Lord Burleigh. He afterwards settled at Cambridge; and by the recommendation of his noble patron, was, in 1574, chosen lady Margaret's professor there. For some years he quietly enjoyed his professorship; but there was at last raised a restless faction against him, by his opposing the doctrine of absolute predestination; which rendered his place so uneasy to him, that he chose to leave the university, and to settle in London. He wrote, 1. *In Jonam Prophetam Prælectionis* xxxix. 2. *De Præstantia & Dignitate Divinæ Legis*; and other pieces. He died in London, about the year 1600.

BAROCCI (Frederic), a celebrated painter, was born at Urbino, where the genius of Raphael inspired him. In his early youth he travelled to Rome; where he painted several things in fresco. He then returned to Urbino, and giving himself up to intense study, acquired a great name in painting. His genius particularly led him to religious subjects. At his leisure hours, he etched a few prints from his own designs; which are highly finished, and executed with great softness and delicacy. The *Salutation* is his capital performance in that way: of which we seldom meet with

Baroque
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Barometer.

with any impressions, but those taken from the retouched plate, which are very harsh. He died at Urbino in 1612, aged 84.

BAROCHE a town of Cambaya, in the dominions of the Great Mogul; it is walled round, and was formerly a place of great trade. It is now inhabited by weavers and such mechanics as manufacture cotton cloth. Here they have the best cotton in the world, and of consequence the best bastas are manufactured in this place. The English and Dutch had formerly factories here, which are now abandoned. E. Long. 72. 5. N. Lat. 22. 15.

BAROCO, in logic, a term given to the fourth mode of the second figure of syllogisms. A syllogism in baroco has the first proposition universal and affirmative, but the second and third particular and negative, and the middle term is the predicate in the two first propositions. For example,

Nullus homo non est bipes :

Non omne animal est bipes :

Non omne animal est homo.

BAROMETER (from βαρ^{ος} weight, and μετρον measure), an instrument for measuring the weight of the atmosphere, and of use in fortelling the changes of the weather, and also for measuring the height of mountains, &c.

1
Principles
of the barometer.

The common barometer consists of a glass tube hermetically sealed at one end, and filled with quicksilver well defecated and purged of its air. The finger being then placed on the open end, in immediate contact with the mercury, so as not to admit the least particle of air, the tube is inverted, and the lower end plunged into a basin of the same prepared mercury; then upon removing the finger, the mercury in the tube will join that in the basin, and the mercurial column in the tube will subside to the height of 29 or 30 inches, according to the state of the atmosphere at that time. This is the principle on which all barometers are constructed. Of their invention, the different kinds of them, and the theories by which their phenomena are solved, we shall proceed to give an historical account.

2
Discovered
by Galilæo,
and im-
proved by
Torricelli.

In the beginning of the last century, when the doctrine of a plenum was in vogue, philosophers were of opinion, that the ascent of water in pumps was owing to the abhorrence of a vacuum; and that by means of suction, fluids might be raised to any height whatever. But Galilæo, who flourished about that time, discovered that water could not ascend in a pump unless the sucker reached within 33 feet of its surface in the well. From hence he concluded, that not the power of suction, but the pressure of the atmosphere, was the cause of the ascent of water in pumps; that a column of water 33 feet high was a counterpoise to one of air of an equal base, whose height extended to the top of the atmosphere; and that for this reason the water would not follow the sucker any farther. From this Torricelli, Galilæo's disciple, took the hint; and considered, that if a column of water of about 33 feet in height was equal in weight to one of air having the same base, a column of mercury no longer than about 29½ inches would be so too, because mercury being about 14 times heavier than water, a column of mercury must be 14 times shorter than one of water equally heavy. Accordingly, having filled a glass tube with mercury, and

inverted it into a basin of the same, he found the mercury in the tube to descend till it stood about 29½ inches above the surface of that in the basin. Barometer.

Notwithstanding this clear proof of the pressure of the atmosphere, however, the assertors of a plenum left no means untried to solve the phenomena of the Torricellian experiment by some other hypothesis. The most ridiculous solution, and which at the same time gave the adverse party the greatest difficulty to overthrow it, was that of Linus. He contended, that in the upper part of the tube, there is a film, or *rope of mercury*, extended through the seeming vacuity; and that, by this rope, the rest of the mercury was suspended, and kept from falling into the basin. Even this so absurd hypothesis he pretended to confirm by the following experiments. Take, says he, a small tube, open at both ends, suppose about 20 inches long; fill this tube with mercury, stopping the lower orifice with your thumb: Then closing the upper end with your finger, and immersing the lower in stagnant mercury, you shall perceive, upon the removal of your thumb, a manifest suction of your finger into the tube; and the tube and mercury will both stick so close to it, that you may carry them about the room. Therefore, says he, the internal cylinder of mercury in the tube is not held up by the preponderate air without; for if so, whence comes so strong a suction, and so firm an adhesion of the tube to the finger?—The same effect follows, though the tube be not quite filled with mercury; for if a little space of air is left at the top, after the tube is immersed in the stagnant mercury, there will be a considerable suction as before.

3
Strange hypothesis of Linus.

4
Experiments in confirmation of it.

These experiments, which are themselves clear proofs of the pressure of the air, supported for some time the *funicular* hypothesis, as it was called, of Linus. But when it was discovered, that if the tube was carried to the top of an high mountain the mercury stood lower than on the plain, and that if removed into the vacuum of an air-pump it fell out altogether, the hypothesis of Linus was rejected by every body.—There are, however, two experiments which create a considerable difficulty. One is mentioned by Mr Huygens, viz. that if a glass tube 75 inches long, or perhaps longer, is filled with mercury well purged of its air, and then inverted, the whole will remain suspended; whereas, according to the Torricellian experiment, it ought to subside immediately to the height of 29 or 30 inches. It is true indeed, that, upon shaking the tube, the mercury presently subsides to that height; but why it should remain suspended at all, more than twice the height to which it can be raised by the pressure of the most dense atmosphere, seems not easily accounted for; and accordingly, in the Philosophical Transactions, we find attempts to account for it by the pressure of a medium more subtle than the common air, and capable of pervading both the mercury and glass. We find there also another very surprising fact of the same kind mentioned; viz. that a pretty large tube under 29 inches in length, filled with mercury, and inverted into a basin of the same, will remain full, though there be a small hole in the top. This, too, is there accounted for by the pressure of a medium more subtle than common air; but by no means in a satisfactory manner. Mr Rowning, who mentions the phenomenon of the 75 inch tube, accounts for it in the following manner. “The cause

5
Refuted.

6
Remarkable experiments by Mr Huygens.

7
Unsatisfactorily accounted for in the Philosophical Transactions.

8
Mr Rowning's solution.

Barometer. cause of this phenomenon seems to be, that by the great weight of so long a column of mercury, it was pressed into so close contact with the glass in pouring in, that, by the mutual attraction of cohesion between the mercury and the glass, the whole column was sustained after the tube was inverted."—Here, however, we must observe, that this solution seems equally unsatisfactory with that of the subtil medium already mentioned; because it is only one end of the column which sustains so great a pressure from the weight of the mercury; and therefore, though five or six inches of the upper part of the tube, where the pressure had been strongest, might thus remain full of mercury, yet the rest ought to fall down. Besides, it is only the outside of the mercurial column that is in contact with the glass, and consequently these parts only ought to be attracted. Therefore, even granting the pressure to be equally violent, on the inversion of the tube, all the way from 29 to 75 inches, yet the glass ought to be only as it were silvered over by a very thin film of mercury, while the middle parts of the column ought to fall out by reason of their fluidity.

⁹
Insufficient

¹⁰
Another experiment with siphons.

¹¹
Solution by Mr Chambers.

¹²
Insufficient.

¹³
Another solution from the action of electricity.

The other experiment hinted at, is with regard to siphons; which though it belongs more properly to the article HYDROSTATICS, yet seems necessary to be mentioned here. It is this: That a siphon, once set a running, will continue to do so though set under the receiver of an air-pump and the air exhausted in the most perfect manner; or if a siphon is filled, and then set under a receiver and the air exhausted, if by any contrivance the end of the lower leg is opened, it will immediately begin to run, and discharge the water of any vessel in which the other leg is placed, as though it was in the open air. The cause of this phenomenon, as well as the former, seems very difficult to be investigated. In Chambers's Dictionary, under the word *Siphon*, we have a solution something similar to the funicular hypothesis of Linus abovementioned; namely, that "fluids in siphons seem as it were to form one continued body; so that the heavier part, descending, like a chain pulls the lighter after it." This might be deemed a sufficient explication, if the siphon was only to empty the water it at first contains in itself: but when we consider that the water in the vessel, which much exceeds the quantity contained in the siphon, is likewise evacuated, Mr Chambers's hypothesis can by no means be admitted; because this would be like the lighter part of a chain pulling the heavier after it.

Concerning the cause of these singular phenomena, we can only offer the following conjecture. The existence of a medium much more subtil than air, and which pervades the vacuum of an air-pump with the utmost facility, is now sufficiently ascertained in the phenomena of electricity. It is also well known, that this fluid surrounds the whole earth to an indeterminate height. If therefore this fluid either is the power of gravity itself, or is acted upon by that power, it must necessarily press upon all terrestrial bodies in a manner similar to the pressure of the atmosphere. If then we could from any vessel entirely exclude this subtil fluid, and form an electrical vacuum, as well as we can do an aerial one by means of the air-pump, we would in that case see fluids as evidently raised by the pressure of the electric matter, as we now see them raised by that of the air. But though this cannot be done, we are

Barometer. assured that there are certain substances, of which glass is one, through which the electric matter cannot pass but with difficulty. We are likewise certain, that though the electric matter passes through the pores of water, metals, &c. with very great facility, yet it still must meet with some resistance from their solid and impenetrable parts, which cannot be pervaded by any material substance. We know also, that all substances do naturally contain a certain quantity of this electric matter, which they are not always ready to part with; and when by any means the fluid they contain is set in motion, they are then said to be *electrified*. Now, though we are certain, that the friction of glass by mercury does set in motion the electric fluid contained in the mercury or in the glass; yet when the tube is filled with the metallic fluid, whatever quantity has been extricated either from the glass or mercury during the time of filling, will be reabsorbed by the metal and conveyed to the earth during the time of inversion; and consequently the mercurial tube, when inverted, will not be electrified, but both glass and mercury will be in their natural state. Here, then, the pressure of the electrical fluid is kept off in some measure from the upper part of the mercury by the glass, which it cannot penetrate easily at least. To the mercury in the basin it has free access, and therefore presses more upon the lower than the upper part; the consequence of which is a suspension of the mercury. It is true, this fluid very easily penetrates the metallic matter; but it must be considered, that the electric fluid itself is in some measure entangled in the particles of the quicksilver, and cannot be extricated without motion. As soon therefore as the tube is shaken, some part of the electricity is extricated, and the mercury begins to descend. The subtilty of the medium is such, that no sooner has it begun to extricate itself, than, by the motion of the metal downwards, it issues forth in great quantities, so as to become visible, like a blue flame, in the dark. The equilibrium is therefore destroyed in an instant, as it would be were we to admit air to the top of the barometer; nay, in a more effectual manner. For if a small quantity of air was admitted to the top of a barometer, the mercury would only descend in proportion to the quantity of air admitted; but here, no sooner is a quantity of electric matter admitted, than it procures admission for a vast deal more, and consequently the mercury descends with accelerated velocity.—On this principle the ascent of water in the siphon while *in vacuo* is so easily accounted for, that we need not take up time in explaining it farther.—But why an inverted glass tube should remain full of mercury when it has a hole either great or small in the top, is more difficult to be accounted for, and requires this farther circumstance to be taken into consideration, viz. that though all solid bodies will, by the action of gravity, or by any other impulse, easily approach very near to one another, yet they cannot be brought into absolute contact without a very considerable force, much greater than is sufficient to overcome their gravity; and thus it appears from some experiments, that the links of a chain are by no means in contact with one another, till the chain has a considerable weight appended to it. This may be the case with the tube in question. The air by its gravity descends upon it, and is ready to enter the small hole in the top;

Barometer. top; but, by a repulsive power from the glass, its action is prevented, so that the mercury cannot fall.

14
Barometers
used for
prognosti-
cating the
weather.

It was, however, some time after the Torricellian experiment had been made, and even after it had been universally agreed that the suspension of the mercury was owing to the weight of the atmosphere, before it was discovered that this pressure of the air was different at different times though the tube was kept in the same place. But the variations of altitude in the mercurial column were too obvious to remain long unobserved; and accordingly philosophers soon became careful enough to mark them. When this was done, it was impossible to avoid observing also, that the changes in the height of the mercury were accompanied, or very quickly succeeded, by changes in the weather. Hence the instrument obtained the name of the *weather-glass*, and was generally made use of with a view to the foreknowledge of the weather. In this character, its principal phenomena are as follow.

15
Its pheno-
mena as a
weather-
glass by Mr
Patrick.

1. The rising of the mercury presages, in general, fair weather; and its falling, foul weather, as rain, snow, high winds, and storms.

2. In very hot weather, the falling of the mercury foreshows thunder.

3. In winter, the rising presages frost; and in frosty weather, if the mercury falls three or four divisions, there will *certainly* follow a thaw. But in a continued frost, if the mercury rises, it will *certainly* snow.

4. When foul weather happens soon after the falling of the mercury, expect but little of it; and, on the contrary, expect but little fair weather when it proves fair shortly after the mercury has risen.

5. In foul weather, when the mercury rises much and high, and so continues for two or three days before the foul weather is quite over, then expect a continuance of fair weather to follow.

6. In fair weather, when the mercury falls much and low, and thus continues for two or three days before the rain comes; then expect a great deal of wet, and probably high winds.

7. The unsettled motion of the mercury denotes uncertain and changeable weather.

8. You are not so strictly to observe the words engraved on the plates (though in general it will agree with them), as the mercury's *rising* and *falling*. For if it stands at *much rain*, and then rises up to *changeable*, it presages fair weather; though not to continue so long as if the mercury had risen higher: and so, on the contrary, if the mercury stood at *fair*, and falls to *changeable*, it presages foul weather; though not so much of it as if it had sunk lower.

16
Remarks
by Mr
Rowning.

These are the observations of Mr Patrick, on which Mr Rowning makes the following remarks. "From these observations it appears, That it is not so much the height of the mercury in the tube that indicates the weather, as the motion of it up and down: wherefore, in order to pass a right judgment of what weather is to be expected, we ought to know whether the mercury is actually rising or falling; to which end the following rules are of use.

"1. If the surface of the mercury is convex, standing higher in the middle of the tube than at the sides, it is generally a sign that the mercury is then rising.

"2. If the surface is concave, it is then sinking; and,

"3. If it is plain, the mercury is stationary; or rather, if it is a little convex: for mercury being put into a glass tube, especially a small one, will naturally have its surface a little convex, because the particles of mercury attract one another more forcibly than they are attracted by glass. Further,

"4. If the glass is small, shake the tube; and if the air is grown heavier, the mercury will rise about half the tenth of an inch higher than it stood before; if it is grown lighter, it will sink as much. This proceeds from the mercury's sticking to the sides of the tube, which prevents the free motion of it till it is disengaged by the shock: and therefore, when an observation is to be made with such a tube, it ought always to be shaken first; for sometimes the mercury will not vary of its own accord, till the weather it ought to have indicated is present."

Here we must observe, that the abovementioned phenomena are peculiar to places lying at a considerable distance from the equator; for, in the torrid zone, the mercury in the barometer seldom either rises or falls much. In Jamaica, it is observed by Sir William Beechey*, that the mercury in the morning constantly stood at one degree below *changeable*, and at noon sunk to one degree above *rain*; so that the whole scale of variation there was only $\frac{1}{8}$ of an inch. At St Helena, too, where Dr Halley made his observations, he found the mercury to remain wholly stationary whatever weather happened. Of these phenomena, their causes, and why the barometer indicates an approaching change of weather, the Doctor gives us the following account.

17
These phe-
nomena pe-
culiar to
the tempe-
rate and
frigid
zones.
* *Philos.
Transact.*
N^o 220.

"1. In calm weather, when the air is inclined to rain, the mercury is commonly low.

"2. In serene, good, and settled weather, the mercury is generally high.

"3. Upon very great winds, though they be not accompanied with rain, the mercury sinks lowest of all, with relation to the point of the compass the wind blows upon.

"4. *Caterus paribus*, the greatest heights of the mercury are found upon easterly, or north-easterly, winds.

"5. In calm frosty weather, the mercury generally stands high.

"6. After very great storms of wind, when the mercury has been very low, it generally rises again very fast.

"7. The more northerly places have greater alterations of the barometer than the more southerly.

"8. Within the tropics, and near them, those accounts we have had from others, and my own observations at St Helena, make very little or no variation of the height of the mercury in all weathers.

"Hence I conceive, that the principal cause of the rise and fall of the mercury is from the variable winds which are found in the temperate zone, and whose great inconstancy here in England is notorious.

"A second cause is, the uncertain exhalation and precipitation of the vapours lodging in the air, whereby it comes to be at one time much more crowded than at another, and consequently heavier; but this latter depends in a great measure upon the former. Now from these principles I shall endeavour to explicate the several phenomena of the barometer, taking them in the same order I have laid them down. Thus,

"1. The mercury's being low inclines it to rain, because

18
Phenomena
of the baro-
meter fol-
lowed by Dr
Halley.

Barometer. because the air being light, the vapours are no longer supported thereby, being become specifically heavier than the medium wherein they floated; so that they descend towards the earth, and, in their fall, meeting with other aqueous particles, they incorporate together, and form little drops of rain: but the mercury's being at one time lower than another, is the effect of two contrary winds blowing from the place where the barometer stands; whereby the air of that place is carried both ways from it, and consequently the incumbent cylinder of air is diminished, and accordingly the mercury sinks: As, for instance, if in the German Ocean it should blow a gale of westerly wind, and, at the same time, an easterly wind in the Irish Sea; or, if in France it should blow a northerly wind, and in Scotland a southerly; it must be granted, that that part of the atmosphere impendant over England would thereby be exhausted and attenuated, and the mercury would subside, and the vapours which before floated in these parts of the air of equal gravity with themselves would sink to the earth.

" 2. The greater height of the barometer is occasioned by two contrary winds blowing towards the place of observation, whereby the air of other places is brought thither and accumulated; so that the incumbent cylinder of air being increased both in height and weight, the mercury pressed thereby must needs stand high, as long as the winds continue so to blow; and then the air being specifically heavier, the vapours are better kept suspended, so that they have no inclination to precipitate and fall down in drops, which is the reason of the serene good weather which attends the greater heights of the mercury.

" 3. The mercury sinks the lowest of all by the very rapid motion of the air in storms of wind. For the tract or region of the earth's surface, wherein the winds rage, not extending all round the globe, that stagnant air which is left behind, as likewise that on the sides, cannot come in so fast as to supply the evacuation made by so swift a current; so that the air must necessarily be attenuated when and where the said winds continue to blow, and that more or less according to their violence: add to which, that the horizontal motion of the air being so quick as it is, may in all probability take off some part of the perpendicular pressure thereof; and the great agitation of its particles is the reason why the vapours are dissipated, and do not condense into drops so as to form rain, otherwise the natural consequence of the air's rarefaction.

" 4. The mercury stands highest upon the easterly and north-easterly wind; because in the great Atlantic Ocean, on this side the 35th degree of north latitude, the winds are almost always westerly or south-westerly; so that whenever here the wind comes up at east and north-east, it is sure to be checked by a contrary gale as soon as it reaches the ocean; wherefore, according to our second remark, the air must needs be heaped over this island, and consequently the mercury must stand high as often as these winds blow. This holds true in this country; but is not a general rule for others, where the winds are under different circumstances: and I have sometimes seen the mercury here as low as 29 inches upon an easterly wind; but then it blew exceedingly hard, and so comes to be accounted for by what was observed in the third remark.

" 5. In calm frosty weather the mercury generally stands high; because (as I conceive) it seldom freezes but when the winds come out of the northern and north-eastern quarters, or at least unless those winds blow at no great distance off. For the north parts of Germany, Denmark, Sweden, Norway, and all that tract from whence north-eastern winds come, are subject to almost continual frost all the winter: and thereby the lower air is very much condensed, and in that state is brought hitherward by those winds, and, being accumulated by the opposition of the westerly wind blowing in the ocean, the mercury must needs be pressed to a more than ordinary height; and as a concurring cause, the shrinking of the lower parts of the air into lesser room by cold, must needs cause a descent of the upper parts of the atmosphere, to reduce the cavity made by this contraction to an equilibrium.

" 6. After great storms, when the mercury has been very low, it generally rises again very fast: I once observed it to rise one inch and an half in less than six hours after a long-continued storm of south-west wind. The reason is, because the air being very much rarefied by the great evacuations which such continued storms make thereof, the neighbouring air runs in the more swiftly to bring it to an equilibrium; as we see water runs the faster for having a greater declivity.

" 7. The variations are greater in the more northerly places, as at Stockholm greater than at Paris (compared by M. Paschal); because the more northerly parts have usually greater storms of wind than the more southerly, whereby the mercury should sink lower in that extreme; and then the northerly winds bringing in the more dense and ponderous air from the neighbourhood of the pole, and that again being checked by a southerly wind at no great distance, and so heaped, must of necessity make the mercury in such case stand higher in the other extreme.

" 8. Lastly, this remark, that there is little or no variation near the equinoctial, does above all others confirm the hypothesis of the variable winds being the cause of these variations of the height of the mercury; for in the places above named there is always an easy gale of wind blowing nearly upon the same point, viz. E. N. E. at Barbadoes, and E. S. E. at St Helena; so that there being no contrary currents of air to exhaust or accumulate it, the atmosphere continues much in the same state: however, upon hurricanes, the most violent of storms, the mercury has been observed very low; but this is but once in two or three years, and it soon recovers its settled state, about 29 $\frac{1}{2}$ inches."

This theory we find controverted in Chambers's ¹⁹Objections Cyclopædia, under the word BAROMETER. The principal objections are, "That if the wind was the sole agent in raising or depressing the mercury, the alterations of its height in the barometer would be only relative or topical; there would still be the same quantity supported at several places taken collectively: thus what a tube at London lost, another at Paris, Pisa, or Zurich, &c. would gain. But the contrary is found to be the case; for, from all the observations hitherto made, the barometers in several distant parts of the globe rise and fall together. This is a very surprising fact; and deserves to be well examined. Again, setting aside

Barometer.

aside all other objections, it is impossible, on Dr Halley's hypothesis, to explain the mercury's fall before, and rise after, rain. For suppose two contrary winds sweeping the air from over London: We know that few if any of the winds reach above a mile high; all therefore they can do will be to cut off a certain part of the column of air over London: if the consequence of this be the fall of the mercury, yet there is no apparent reason for the rains following it. The vapours indeed may be let lower; but it will only be till they come into an air of the same specific gravity with themselves, and there they will stick as before. Lastly, it is impossible, according to the laws of fluids, that the air above any place could be exhausted by the blowing of two contrary winds from it: for, suppose a north-east and south-west wind both blow from London at the same time, there will be two others at the same time blowing towards it from opposite points, viz. a N. W. and S. E. one, which will every moment restore the equilibrium, so that it can never be lost in any considerable degree at least."

20
Hypothesis
by Mr
Leibnitz.

Mr Leibnitz accounted for the sinking of the mercury before rain upon another principle, viz. That as a body specifically lighter than a fluid, while it is suspended by it, adds more weight to that fluid than when, by being reduced in its bulk, it becomes specifically heavier, and descends; so the vapour, after it is reduced into the form of clouds, and descends, adds less weight to the air than before; and therefore the mercury falls. To which it is answered, 1. That when a body descends in a fluid, its motion in a very little time becomes uniform, or nearly so, a farther acceleration of it being prevented by the resistance of the fluid; and then, by the third law of nature, it forces the fluid downwards with a force equal to that whereby it tends to be farther accelerated, that is, with a force equal to its whole weight. 2. The mercury by its descent fortels rain a much longer time before it comes, than the vapour after it is condensed into clouds can be supposed to take up in falling. 3. Supposing that as many vapours as fall in rain during a whole year were at once to be condensed into clouds, and even quite cease to gravitate upon the air, its gravity would scarce be diminished thereby so much as is equivalent to the descent of two inches of mercury in the barometer. Besides, in many places between the tropics, the rains fall at certain seasons in very great quantities, and yet the barometer shows there very little or no alteration in the weight of the atmosphere.

22
Insufficient
hypothesis
of Mr
Chambers.

Mr Chambers gives an hypothesis somewhat similar to that of Leibnitz: but as it is liable to the objections just now mentioned, especially the last, we forbear to give any particular account of it; and shall attempt, upon other principles, to give a satisfactory solution of this phenomenon.

23
Another
theory.

The necessary preliminaries to our hypothesis are, 1. That vapour is formed by an intimate union between the element of fire and that of water, by which the fire or heat is so totally enveloped, and its action so entirely suspended by the watery particles, that it not only loses its properties of giving light and of burning, but becomes incapable of affecting the most sensible thermometer; in which case, it is said by Dr Black, the author of this theory, to be in a latent state. For the

proofs of this, see the articles EVAPORATION, COLD, Barometer, CONGELATION, &c. 2. If the atmosphere is affected by any unusual degree of heat, it thence becomes incapable of supporting so long a column of mercury as before, for which reason that in the barometer sinks. This appears from the observations of Sir William Beefton already mentioned; and likewise from those of De Luc, which shall be afterwards taken notice of.

These axioms being established, it thence follows, that as vapour is formed by an union of fire with water, or if we please to call it an *elective* attraction between them, or solution of the water in the fire, it is impossible that the vapour can be condensed until this union, attraction, or solution, be at an end. The beginning of the condensation of the vapour then, or the first symptoms of an approaching rain, must be the separation of the fire which lies hid in the vapour. This may be at first slow and partial, or it may be sudden and violent: in the first case, the rain will come on slowly, and after a considerable interval; and in the other, it will be very quick, and in great quantity. But Dr Black hath proved, that when fire quits its latent state, however long it may have lain dormant and insensible, it always assumes its proper qualities again, and affects the thermometer as though it had never been absorbed. The consequence of this must be, that in proportion as the latent heat is discharged from the vapour, it must sensibly affect those parts of the atmosphere into which it is discharged; and in proportion to the heat communicated to these, they will become specifically lighter, and the mercury sink of course. Neither are we to imagine that the quantity of heat discharged by the vapour is inconsiderable; for Dr Black hath shown, that when any quantity of water, a pound for instance, is condensed from the vapour of a common still, as much heat is communicated to the head and refrigeratory as would have been sufficient to heat the pound of water red-hot, could it have borne that degree of sensible heat.

The causes by which this separation between the fire and water is, or may be affected, come to be considered under the articles RAIN, CONDENSATION, VAPOUR, &c. Here we have only to observe, that as the separation may be gradual and slow, the barometer may indicate rain for a considerable time before it happens: or if the sensible heat communicated from the vapour to the atmosphere shall be absorbed by the colder parts, or by any unknown means carried off, or prevented from affecting the specific gravity of the air, the barometer will not be affected; and yet the water being deprived of the heat necessary to sustain it, must descend in rain; and thus it is found that the indications of the barometer do not always hold true. Hence also it appears, that though the specific gravity of the air is diminished, unless that diminution proceeds from a discharge of the latent heat contained in the vapours, no rain will follow; and thus the sinking of the barometer may prognosticate wind as well as rain, or sometimes nothing at all.

The difficulty, however, on this hypothesis is to account for the barometer being stationary in all weathers between the tropics; whereas it ought to move up and down there as well as here, only more suddenly, as the changes of weather there are more sudden than here. But it must be considered, that in these climates, during the

Barometer. the day-time, the action of the sun's rays is so violent, that what is gained by the discharge of latent heat from the vapour is lost by the interposition of the clouds betwixt the sun and earth, or by the great evaporation which is constantly going on; and in the night, the cold of the atmosphere is so much increased, that it absorbs the heat as fast as the vapour discharges it, so that no sensible effect can be produced; for in warm climates, though the day is excessively hot, the night is observed to be vastly colder in proportion than it is with us. This, however, does not prevent the barometer from being affected by other causes, as well as with us; for Dr Halley observes, that in the time of hurricanes it sinks very low. The cause of this is most probably a great commotion in the electric fluid, by which the air is internally agitated, and its power of gravitation in part suspended.—A confirmation of the above hypothesis, however, is taken from the different heights at which the mercury arrives in different climates. The barometer range, for instance, at the latitude of 45° is the greatest of all; because here the evaporation and condensation of the vapours are both very considerable, at the same time that the latent heat discharged cannot be absorbed so suddenly as in the torrid zone, the difference betwixt the length of the days and nights being greater, and consequently the nights warmer in summer and colder in winter. Farther to the northward the range is less, and in the latitude of 60° only two inches, by reason of the greater cold and length of the days and nights; whence the quantity of vapour condensed, or of latent heat expelled, becomes proportionably less.

²⁴
Different
kinds of
barometers
described.

Having thus given an account of the several phenomena of the barometer considered as a weather-glass, and likewise endeavoured to account for them in the most satisfactory manner, we now proceed to give a particular description of the barometers most commonly made use of, with various schemes for their improvement.

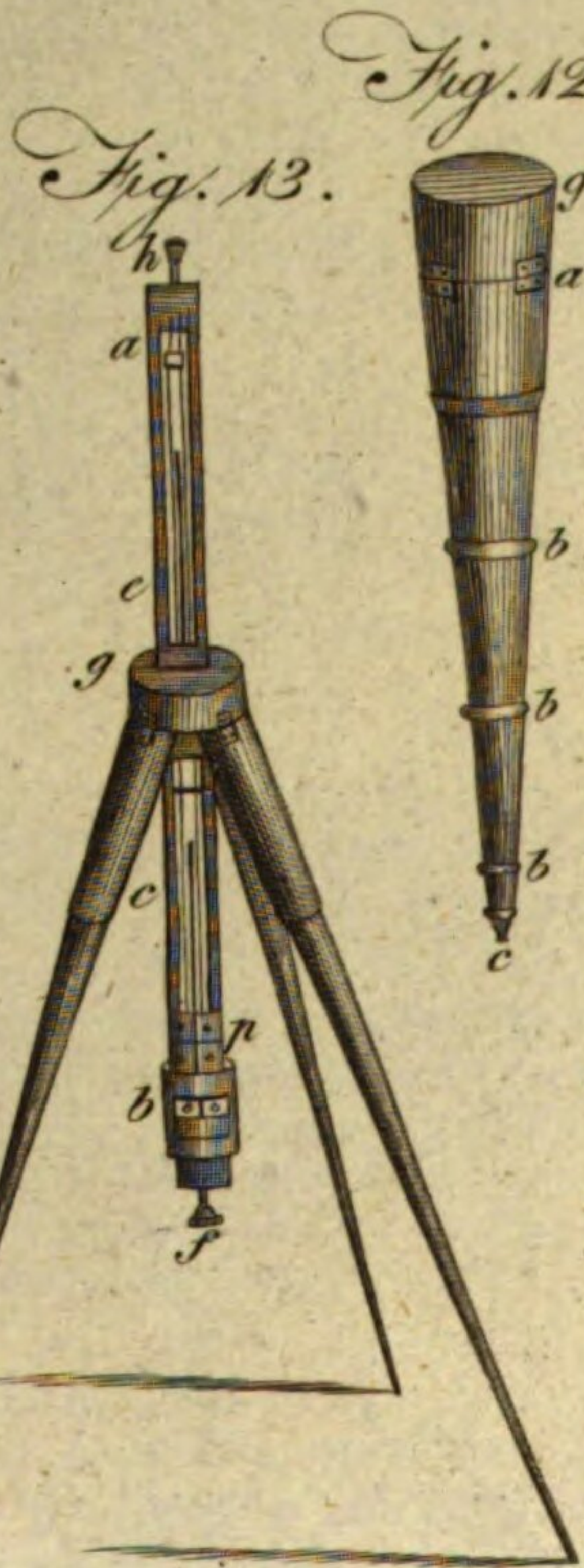
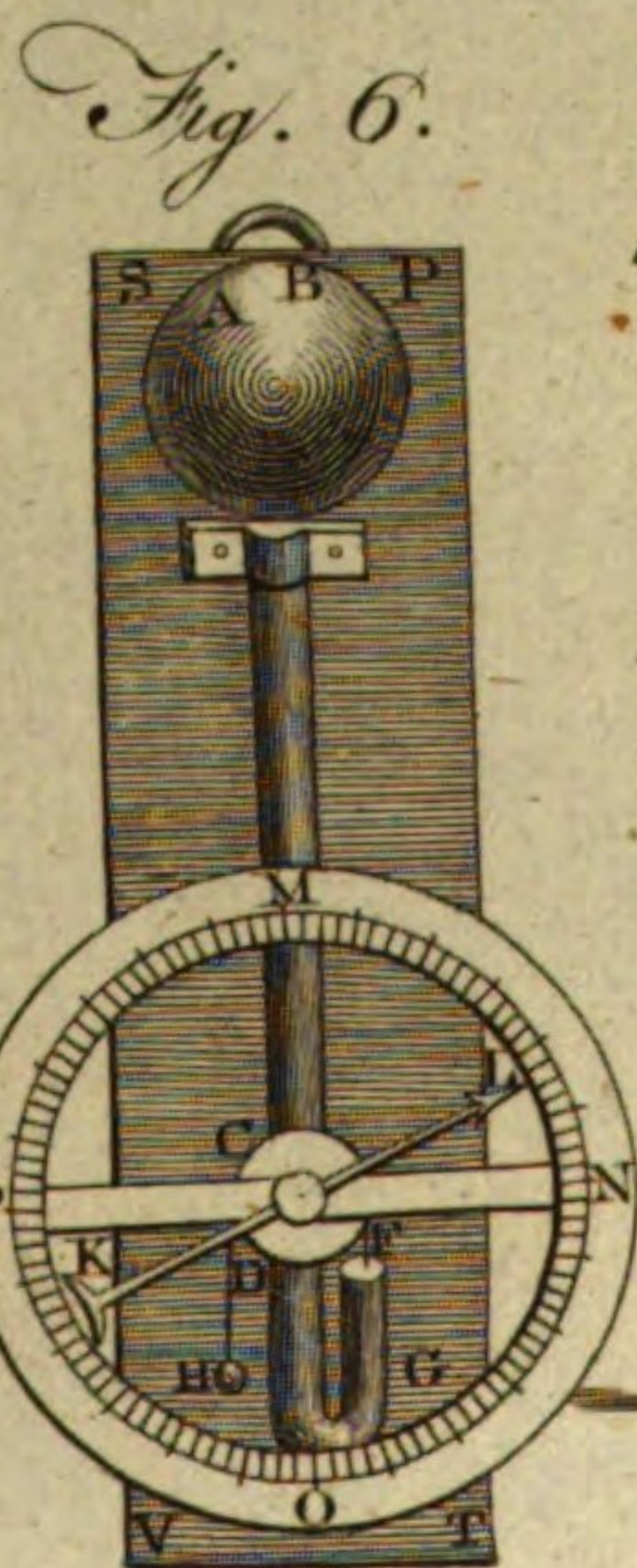
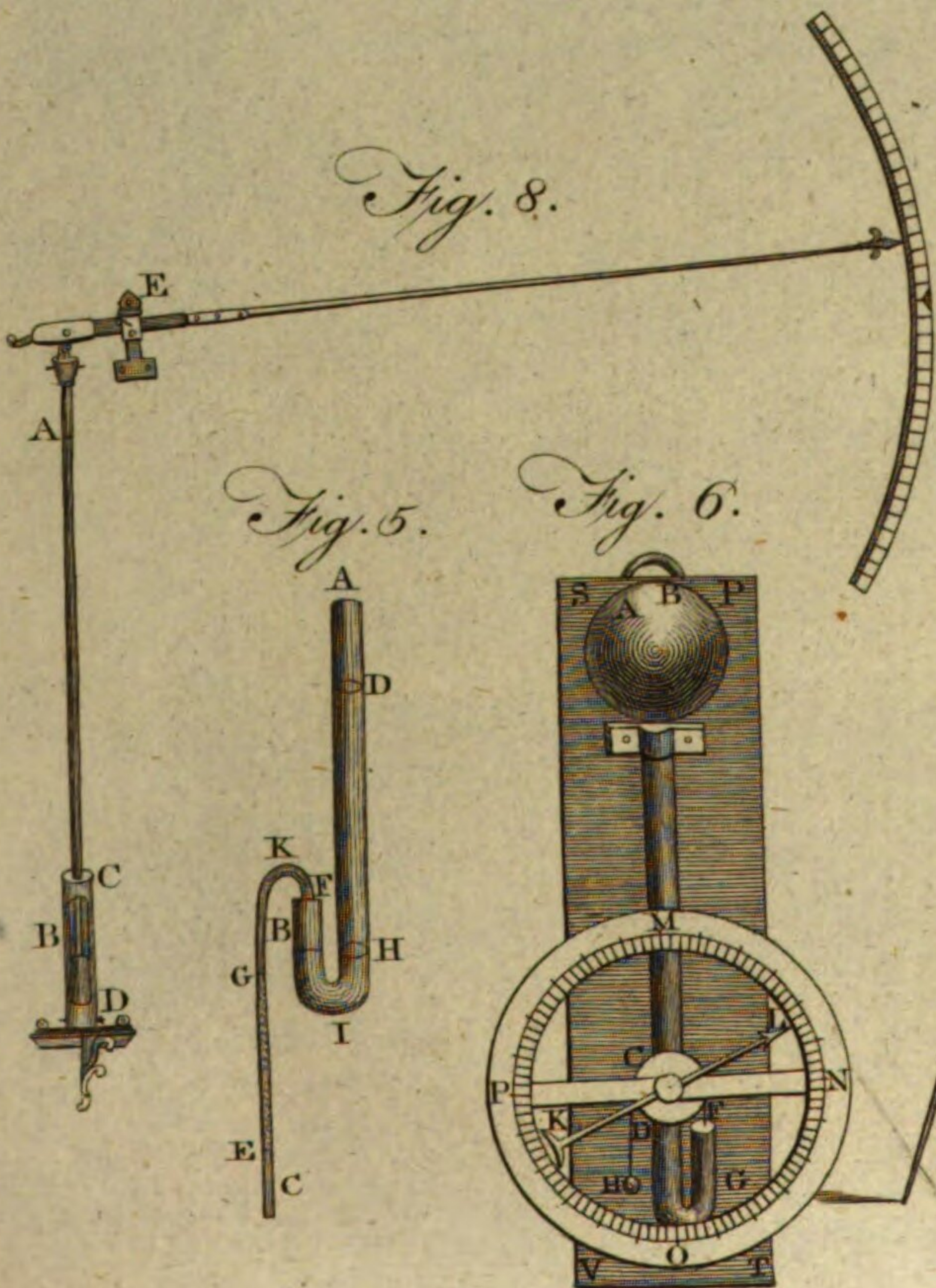
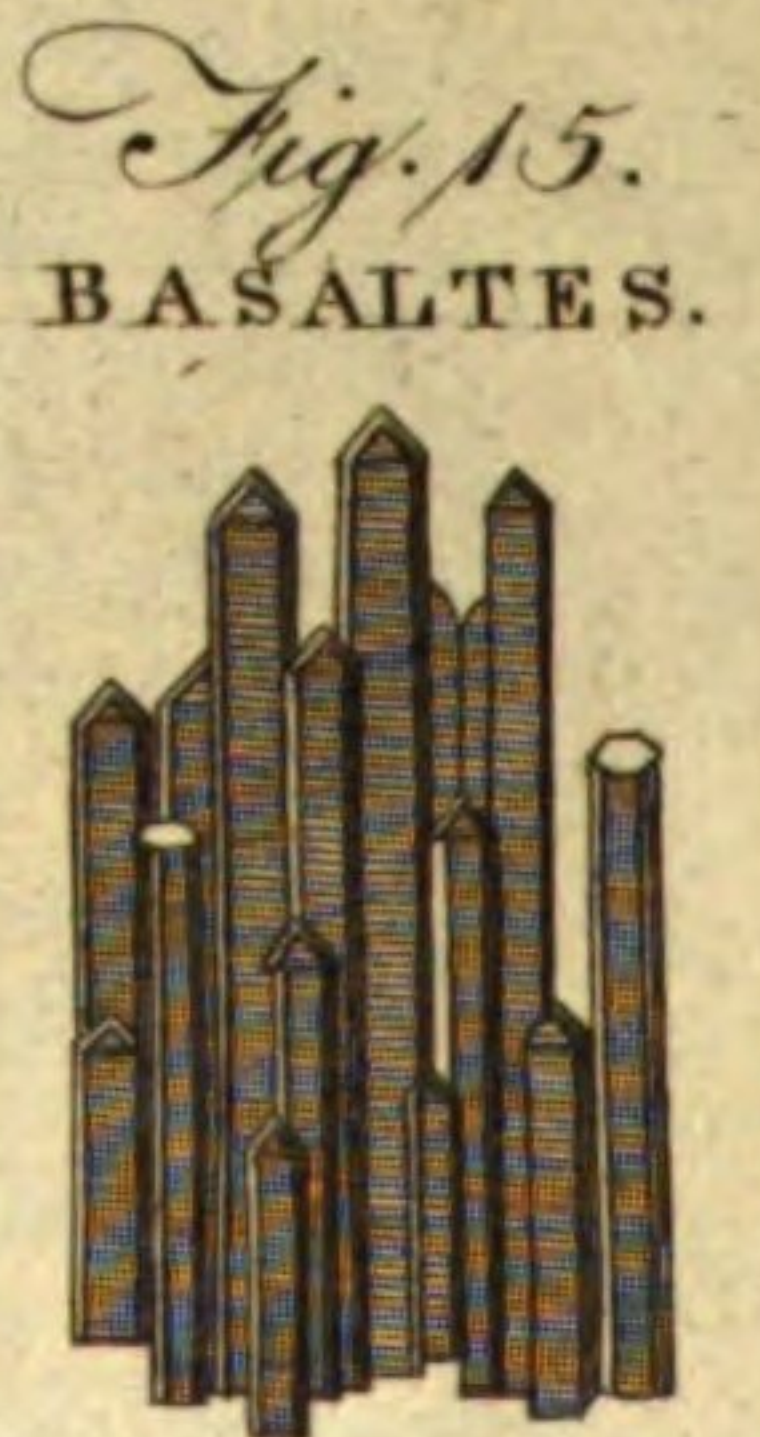
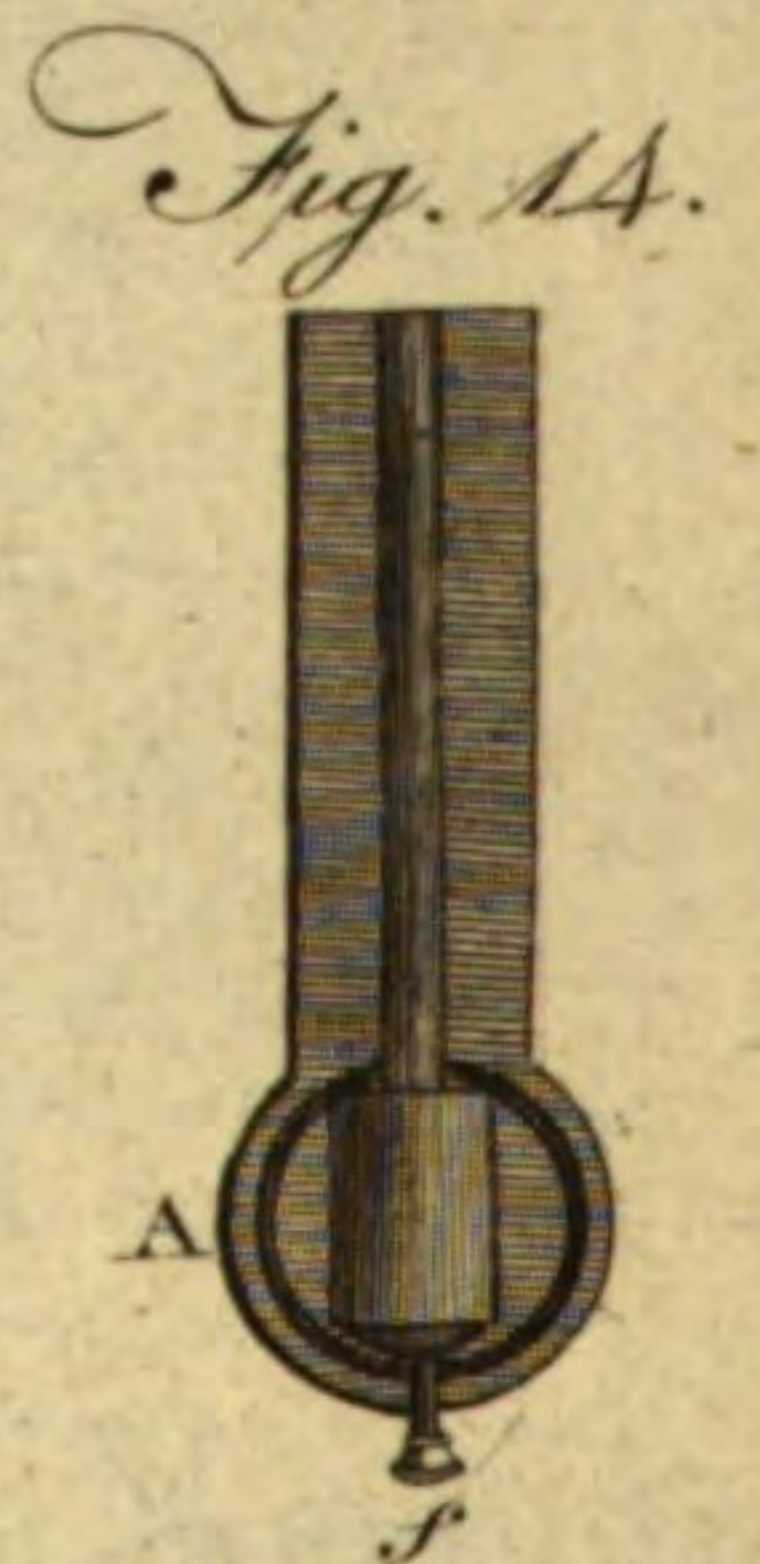
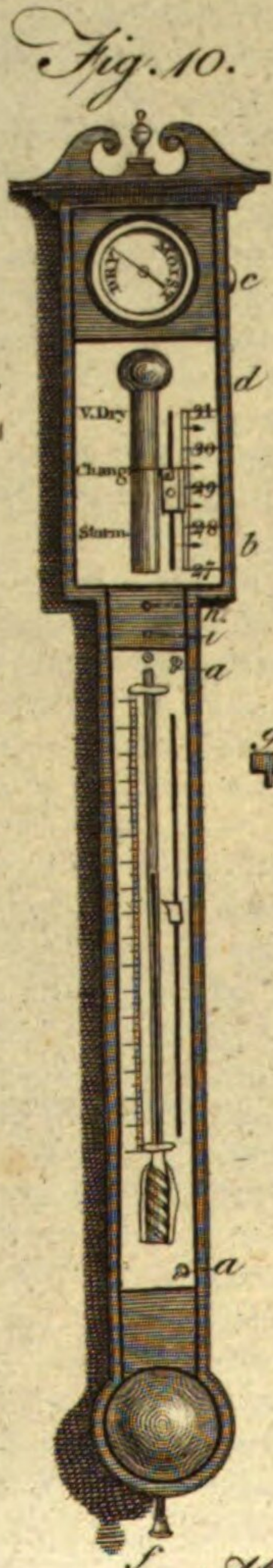
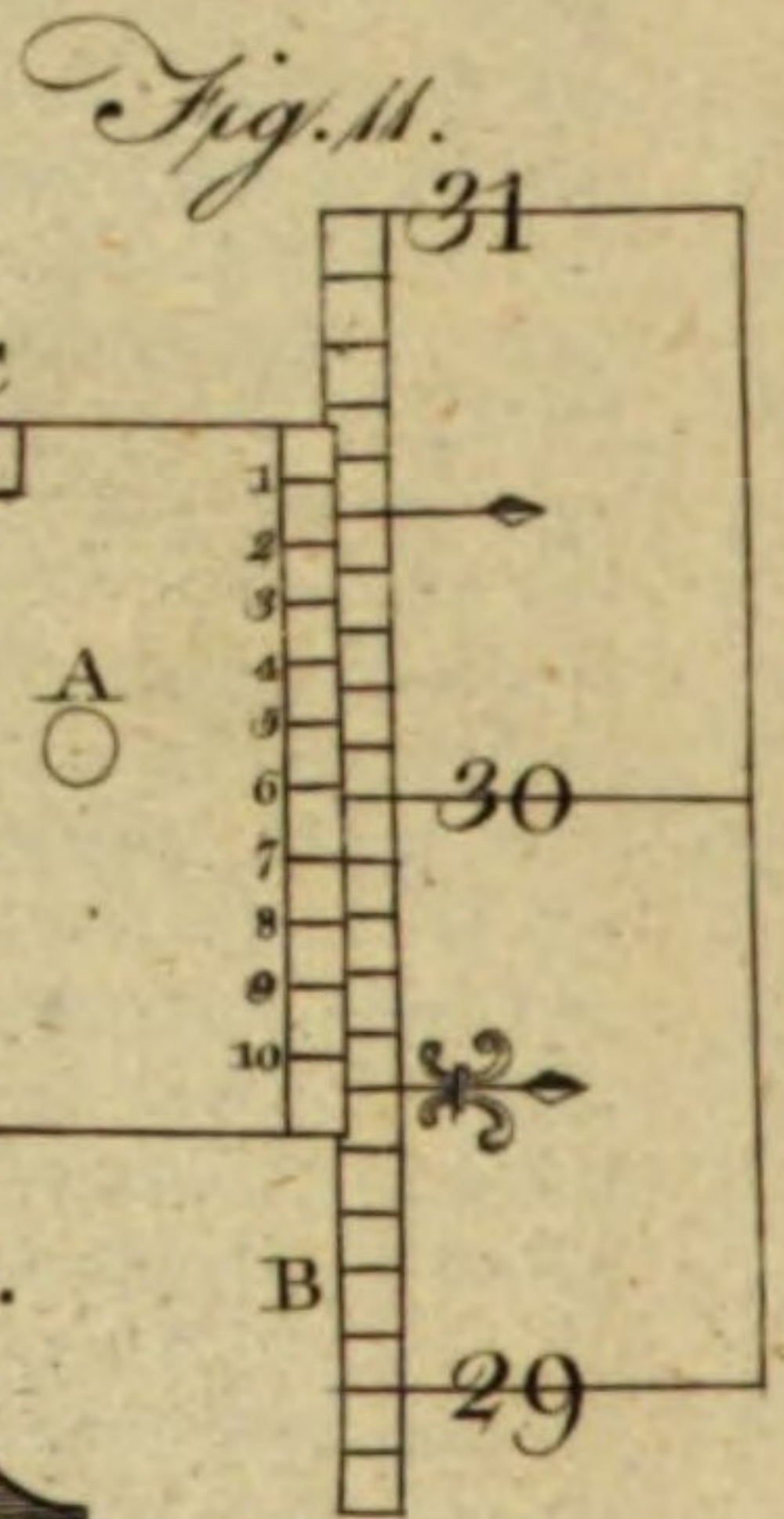
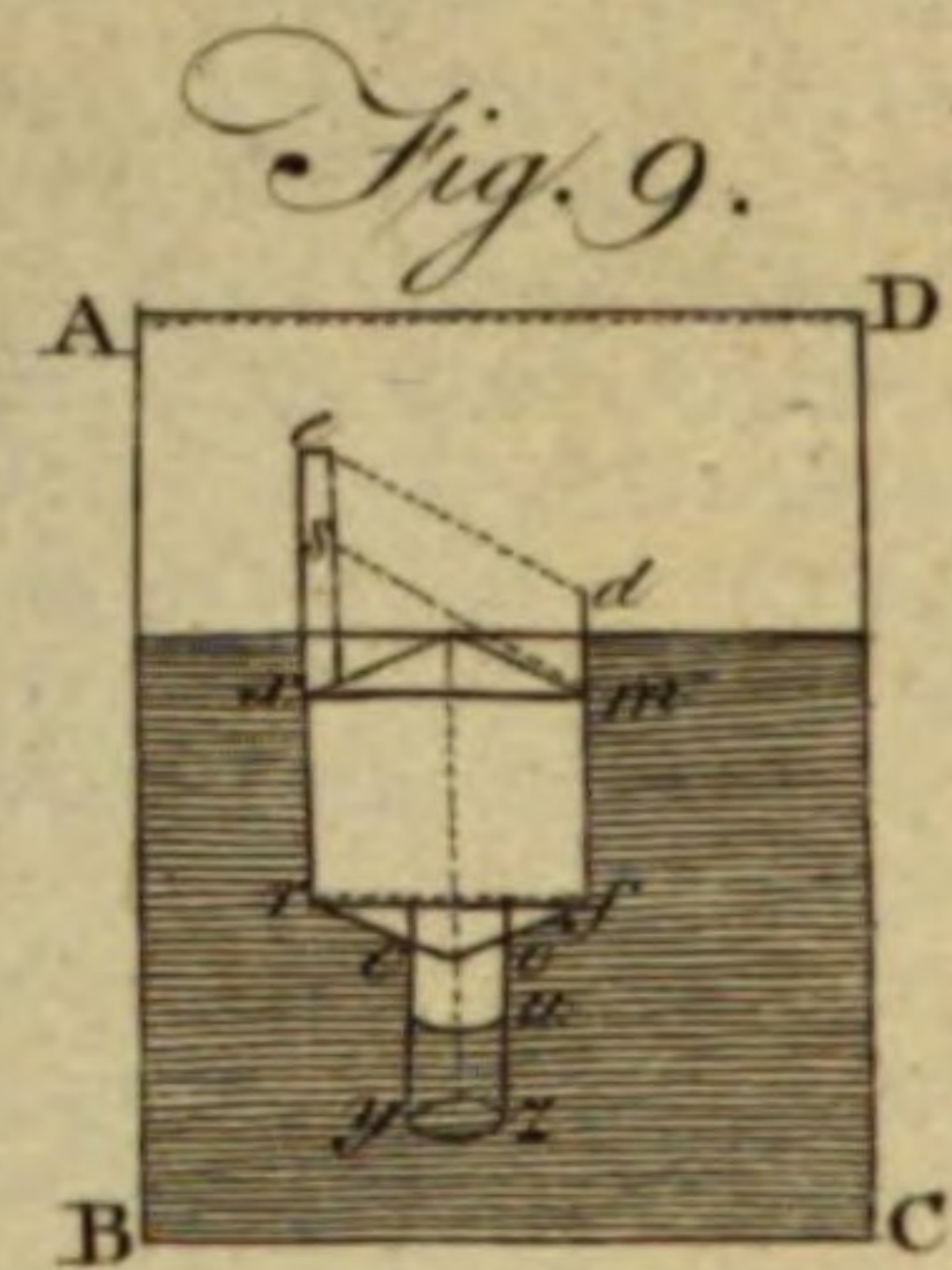
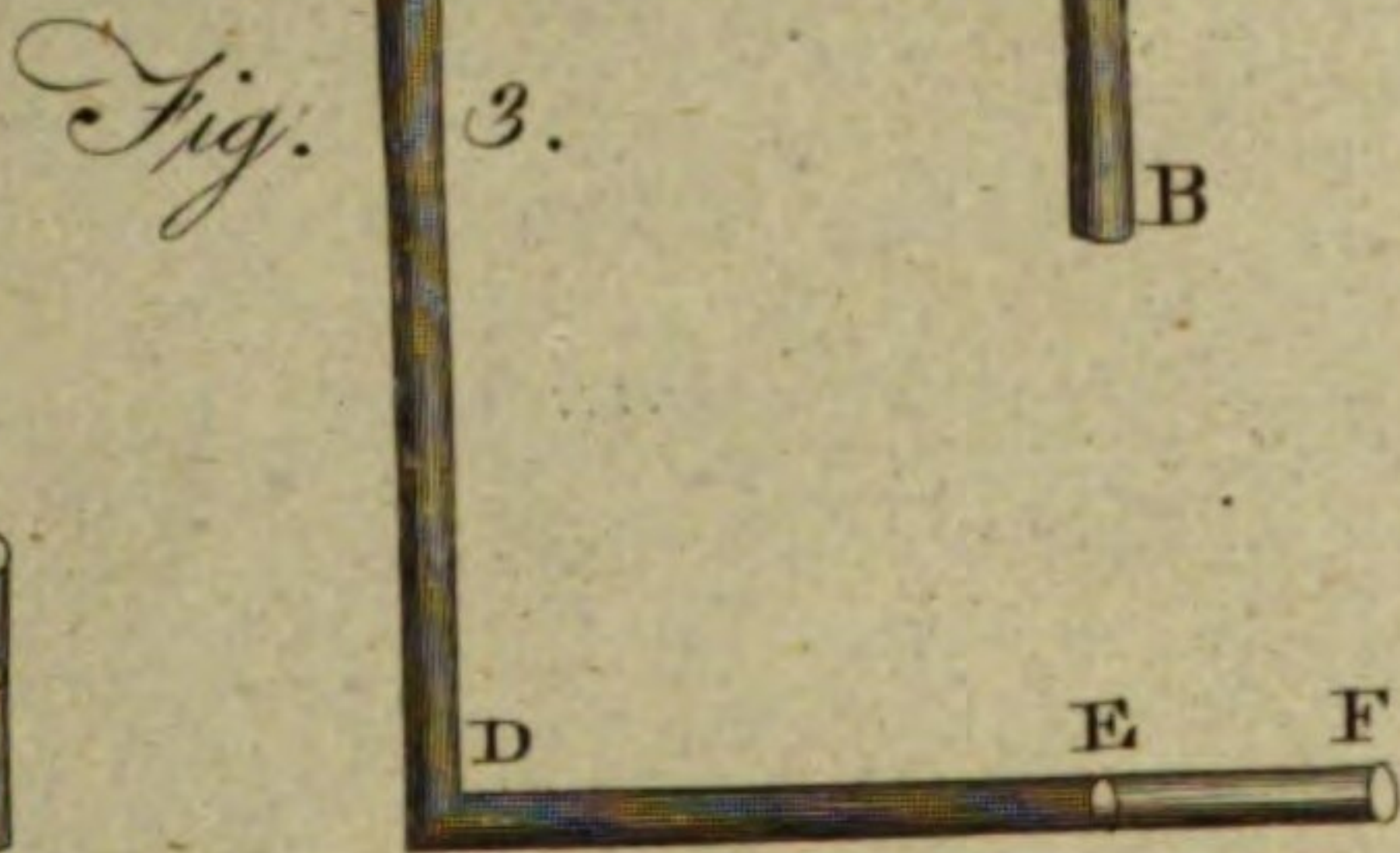
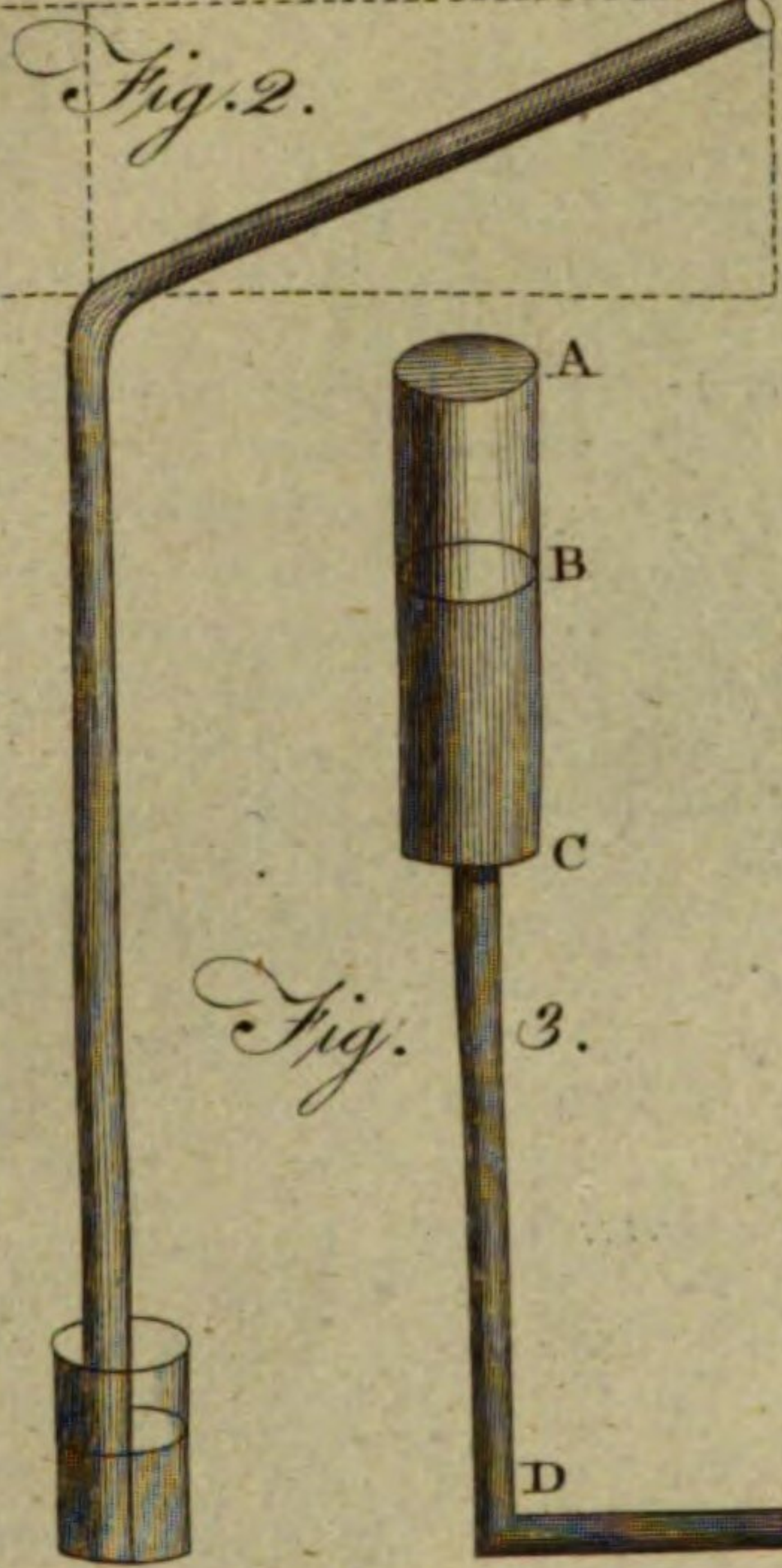
Plate XCII. Fig. 1. represents the common barometer, such as was invented by Torricelli, and such as we have already given a general description of. AB represents a tube of glass, a quarter of an inch in diameter, and 34 inches long, hermetically sealed at A. This tube being supposed to be filled with mercury, is then inverted into the basin CD; upon which the mercury in the tube falls down to GH, somewhat above 28 inches, while that in the basin rises to CF. The lowest station of the mercury in this country is found to be 28 inches, and the highest 31. From the surface of the mercury CF, therefore, 28 inches are to be measured on the tube AB, which suppose to reach to the point K. This point, therefore, is the lowest of the scale of variation, and in the common barometers is marked *stormy*. In like manner, the highest point of the scale of variation I, is placed 31 inches above EF; and is marked *very dry* on one side for the summer, and *very hard frost* on the other for the winter. The next half inch below is marked *set fair* on the one side, and *set frost* on the other. At 30 inches from CF is marked the word *fair* on one side, and *frost* on the other. Half an inch below that, is wrote the word *changeable*, which answers both for summer and winter. At 29 inches is *rain* on the one side, and *snow* on the other; and at $28\frac{1}{2}$ are the words *much rain* on the one

side, and *much snow* on the other. Each of these large divisions is usually subdivided into 10; and there is a small sliding index fitted to the instrument, by which the ascent or descent of the mercury to any number of divisions is pointed out. Each of these tenths is sometimes divided into *ten* more, or *hundredths* of an inch, by means of a sliding slip of brass with a *vernier* scale on it, which shall be hereafter described and explained. This kind of barometer is the most common, and perhaps the most useful and accurate, of any that has yet been invented, from the following circumstance, that the natural simplicity of its construction, in preference to others hereafter described, does not admit of any kind of resistance to the free motion of the column of mercury in the tube. The scale of variation being only three inches, and it being naturally wished to discover more minute variations than can thus be perceived, several improvements have been thought of.

The improvement most generally adopted is the diagonal barometer represented fig. 2. in which the scale of variation, instead of three inches, may be made as many feet, by bending the tube so as to make the upper part of it the diagonal of a parallelogram of which the shortest side is the three-inches scale of variation of the common barometer. This, however, has a very great inconvenience: for not only is the friction of the mercury upon the glass so much increased that the height doth not vary with every slight change of air; but the column of mercury is apt to break in the tube, and part of it to be left behind, upon any considerable descent.

Fig. 3. is the rectangular barometer; where AC represents a pretty wide cylinder of glass, from which proceeds the tube CDF bent into a right angle at D. Suppose now the cylinder AC to be four times larger than the tube CD, so that every inch of the cylinder from C to A should be equal in capacity to four inches of the tube CD. The whole being then filled with mercury, and inverted, the mercury will subside from A to B, at the same time that it cannot run out at the open orifice F, because the air presses in that way. If any alteration then happens in the weight of the air, suppose such as would be sufficient to raise the mercury an inch from B towards A, it is evident that this could not be done without the mercury in the horizontal leg retiring four inches from E towards D; and thus the scale of variation counted on the horizontal leg would be 12 inches. But the inconveniences of friction are much greater here than in the diagonal barometer; and besides, by the least accident the mercury is apt to be driven out at the open orifice F.

The pendant barometer (fig. 4.) consists of a single tube, suspended by a string fastened to the end A. This tube is of a conical or tapering figure, the end A being somewhat less than the end B. It is hermetically sealed at A, and filled with mercury: then will the mercury sink to its common station, and admit of a length of altitude CD, equal to that in the common barometers. But from the conical bore of the tube, the mercury will descend as the air grows lighter, till it reaches its lowest altitude, when the mercury will stand from the lower part of the tube B to E, so that BE will be equal to 28 inches; consequently the mercury will, in such a tube, move from A to E, or 32 inches, if the tube be five feet, or 60 inches; and therefore the



Barometer. the scale AE is here above ten times greater than in the common barometer: but the fault of this barometer is, that the tube being of a very small bore, the friction will be considerable, and prevent its moving freely; and if the tube is made of a wider bore, the mercury will be apt to fall out.

Fig. 5. is an invention of Mr Rowning, by which the scale of variation may be increased to any length, or even become infinite. ABC is a compound tube hermetically sealed at A, and open at C, empty from A to D, filled with mercury from thence to B, and from thence to E with water. Let GBH be a horizontal line; then it is plain from the nature of the siphon, that all the compound fluid contained in the part from H to G, will be always in *equilibrium* with itself, be the weight of the air what it will, because the pressure at H and G must be equal. Whence it is evident, that the column of mercury DH is in *equilibrium* with the column of water GE, and a column of air taken conjointly, and will therefore vary with the sum of the variations of these. That the variation in this barometer may be infinite, will appear from the following computation. Let the proportion between the bores of the tube AF and FC be such, that when HD, the difference of the legs wherein the mercury is contained, is augmented one inch, GE, the difference of the legs wherein the water is contained, shall be diminished 14: then, as much as the pressure of the mercury is augmented, that of the water will be diminished, and so the pressure of both taken together will remain as it was; and consequently, after it has begun to rise, it will have the same tendency to rise on, without ever coming to an equilibrium with the air.

Fig. 6. represents Dr Hook's wheel-barometer. Here ACDG is a glass tube, having a large round head at A, and turned up at the lower end F. Upon the surface of the mercury in the bent leg is an iron ball G, with a string going over a pulley CD. To the other end of the string is fastened a smaller ball H, which as the mercury rises in the leg FG, turns the index KL from N towards M, on the graduated circle MNOP; as it rises in the other leg, the index is carried the contrary way by the descent of the heavier ball G, along with the mercury. The friction of this machine, however, unless it is made with very great accuracy, renders it useless.

Fig. 7. is another barometer, invented by Mr Rowning, in which also the scale may be infinite. ABCD is a cylindrical vessel, filled with a fluid to the height W, in which is immersed the barometer SP consisting of the following parts: The principal one is the glass tube TP (represented separately at *tp*), whose upper end T is hermetically sealed: this end does not appear to the eye, being received into the lower end of a tin pipe GH, which in its other end G receives a cylindrical rod or tube ST, and thus fixes it to the tube TP. This rod ST may be taken off, in order to put in its stead a larger or a lesser as occasion requires. S is a star at the top of the rod ST; and serves as an index by pointing to the graduated scale LA, which is fixed to the cover of the vessel ABCD. MN is a large cylindrical tube made of tin (represented separately at *mn*), which receives in its cavity the smaller part of the tube TP, and is well cemented to it at both ends, that

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none of the fluid may get in. The tube TP, with this apparatus, being filled with mercury, and plunged into the basin MP, which hangs by two or more wires upon the lower end of the tube MN, must be so poised as to float in the liquor contained in the vessel ABCD; and then the whole machine rises when the atmosphere becomes lighter, and *vice versa*. Let it now be supposed, that the fluid made use of is water; that the given variation in the weight of the atmosphere is such, that, by pressing upon the surface of the water at W, the surface of the mercury at X may be raised an inch higher (measuring from its surface at P) than before; and that the breadth of the cavity of the tube at X, and of the basin at P, are such, that by this ascent of the mercury, there may be a cubic inch of it in the cavity X more than before, and consequently in the basin a cubic inch less. Now, upon this supposition, there will be a cubic inch of water in the basin more than there was before; because the water will succeed the mercury, to fill up its place. Upon this account the whole machine will be rendered heavier than before by the weight of a cubic inch of water; and therefore will sink, according to the laws of hydrostatics, till a cubic inch of that part of the rod WS, which was above the surface of the water at W, comes under it. Then, if we suppose this rod so small, that a cubic inch of it shall be 14 inches in length, the whole machine will sink 14 inches lower into the fluid than before; and consequently the surface of the mercury in the basin will be pressed more than it was before, by a column of water 14 inches high. But the pressure of 14 inches of water is equivalent to one of mercury; this additional pressure will make the mercury ascend at X as much as the supposed variation in the weight of the air did at first. This ascent will give room for a second cubic inch of water to enter the basin; the machine will therefore be again rendered so much heavier, and will subside 14 inches farther, and so on *in infinitum*. If the rod was so small that more than fourteen inches of it were required to make a cubic inch, the variation of this machine would be negative with respect to the common barometer; and instead of coming nearer to an equilibrium with the air by its ascent or descent, it would continually recede farther from it: but if less than 14 inches of rod were required to make a cubic inch, the scale of variation would be finite, and might be made in any proportion to the common one. Neither this nor the other infinite barometer have ever been tried, so that how far they would answer the purposes of a barometer is as yet unknown.

Fig. 8. represents another contrivance for enlarging the scale of the barometer to any size.—AB is the tube of a common barometer open at B and sealed at A, suspended at the end of the lever which moves on the fulcrum E.—CD is a fixt glass tube, which serves in place of the cistern. This last tube must be so wide as to allow the tube AB to play up and down within it.—AB being filled with mercury, is nearly counterbalanced by the long end of the lever. When the atmosphere becomes lighter, the mercury descends in the long tube, and the surface of the mercury rising in the cistern pushes up the tube AB, which at the same time becoming lighter, the lever preponderates, and points out the most minute variations. Here too

D

the

Barometer. the friction occasions inconveniences; but this may be in some measure remedied by a small shake of the apparatus at each inspection.

In the Philosophical Transactions, Mr Caswell gives the following account of a barometer, which is recommended by Mr Chambers as the most exact hitherto invented. "Let ABCD (Fig. 9.) represent a bucket of water, in which is the barometer *erexosm*, which consists of a body *ersm*, and a tube *exyo*: the body and tube are both concave cylinders communicating with one another, and made of tin: the bottom of the tube *zy*, has a lead weight to sink it so that the top of the body may just swim even with the surface of the water by the addition of some grain weights on the top. The water, when the instrument is forced with its mouth downwards, gets up into the tube to the height *yu*. There is added on the top a small concave cylinder, which I call the *pipe*, to distinguish it from the bottom small cylinder which I call the *tube*. This pipe is to sustain the instrument from sinking to the bottom: *md* is a wire; *ms*, *de*, are two threads oblique to the surface of the water, which threads perform the office of diagonals: for that while the instrument sinks more or less by the attraction of the gravity of the air, there where the surface of the water cuts the thread, is formed a small bubble; which bubble ascends up the thread, as the mercury in the common barometer ascends."

The dimensions of this instrument given there are, 21 inches for the circumference of the body, the altitude 4, each base having a convexity of $6\frac{1}{2}$ inches. The inner circumference of the tube is 5.14 inches, and its length $4\frac{1}{2}$; so that the whole body and tube will contain almost $2\frac{1}{2}$ quarts. The circumference of the pipe, that the machine may not go to the bottom on every small alteration of the gravity of the air, is 2.14 inches; according to which dimensions, he calculates that it will require 44 grains to sink the body to the bottom, allowing it only four inches to descend; at the same time that it is evident, that the fewer grains that are required to sink it to this depth, the more nice the barometer will be. He also calculates, that when the mercury in the common barometer is $30\frac{1}{2}$ inches high, the body with a weight of 44 grains on its top will be kept in *equilibrio* with the water; but when the mercury stands at 28 inches, only 19 grains can be supported: and lastly, by computing the lengths of the diagonal threads, &c. he finds, that his instrument is 1200 times more exact than the common barometer. The following are his observations on the use of it.

25
Mr Caswell's observations with his barometer.

"1. While the mercury of the common barometer is often known to be stationary 24 hours together, the bubble of the new barometer is rarely found to stand still one minute.

"2. Suppose the air's gravity increasing, and accordingly the bubble ascending; during the time that it ascends 20 inches, it will have many short descents of the quantity of half an inch, one, two, three, or more inches; each of which being over, it will ascend again. These retrocessions are frequent, and of all varieties in quantity and duration; so that there is no judging of the general course of the bubble by a single inspection, though you see it moving, but by waiting a little time.

"3. A small blast of wind will make the bubble descend; a blast that cannot be heard in a chamber of the town will sensibly force the bubble downward. The blasts of wind sensible abroad, cause many of the abovementioned retrocessions or accelerations in the general course; as I found by carrying my barometer to a place where the wind was perceptible.

"4. Clouds make the bubble descend. A small cloud approaching the zenith, works more than a great cloud near the horizon. In cloudy weather, the bubble descending, a break of the clouds (or clear place) approaching to the zenith, has made the bubble to ascend: and after that break had passed the zenith a considerable space, the bubble again descended.

"5. All clouds (except one) hitherto by me observed, have made the bubble to descend. But the other day, the wind being north, and the course of the bubble descending, I saw to the windward a large thick cloud near the horizon, and the bubble still descended: but as the cloud drew near the zenith, it turned the way of the bubble, making it to ascend; and the bubble continued ascending till the cloud was all passed, after which it resumed its former descent. It was a cloud that yielded a cold shower of small hail."

These are the most remarkable contrivances for the improvement of the common barometer: and indeed we must agree with Mr Chambers, that the last, on account of its being so exceedingly sensible, and likewise easy of construction and portable, seems to deserve attention much more than the others, which are always the more unexact, and the less easily moved, according to the enlargement of their scale; whereas this is seemingly subject to no such inconvenience. It is evident, however, that none of these could be used at sea, on account of the unsteady motion of the ship: for which reason Dr Hook thought of constructing a barometer upon other principles.

His contrivance was no other than two thermometers. The one was the common spirit-of-wine thermometer, which is affected only by the warmth of the air: the other, which acts by the expansion of a bubble of air included, is affected not only by the external warmth, but by the various weight of the atmosphere. Therefore, keeping the spirit thermometer as a standard, the excess of the ascent or descent of the other above it would point out the increase or decrease of the specific gravity of the atmosphere. This instrument is recommended by Dr Halley, who speaks of it as follows. "It has been observed by some, that, in long keeping this instrument, the air included either finds a means to escape, or deposits some vapours mixed with it, or else for some other cause becomes less elastic, whereby in process of time it gives the height of the mercury somewhat greater than it ought: but this, if it should happen in some of them, hinders not the usefulness thereof, for that it may at any time very easily be corrected by experiment, and the rising and falling thereof are the things chiefly remarkable in it, the just height being barely a curiosity.

"I had one of these barometers with me in my late southern voyage, and it never failed to prognosticate and give early notice of all the bad weather we had,

Barometer. so that I depended thereon, and made provision accordingly; and from my own experience I conclude, that a more useful contrivance hath not for this long time been offered for the benefit of navigation."

28
Chamber
barometer
by Mr Wil-
liam Jones.

Fig. 10. represents a kind of *Chamber Barometer*, or a complete instrument for observing in a fixed place, such as a room, &c. the changes in the atmosphere. It is constructed by Mr W. Jones optician, London; and consists of barometer *d*, thermometer *aa*, and hygrometer *c*, all in one mahogany frame. One advantage of this instrument is, that either the thermometer or hygrometer may be taken from the frame, and occasionally made use of in another place if required. The thermometer is separated by only unscrewing two screws *a, a*; and the hygrometer, by unscrewing a brass pin at the back of the frame, not seen in this figure. The index of the hygrometer is at any time set, by only moving with your finger the brass wheel seen at *c*; the two sliding indexes of the barometer and thermometer are moved by a rack-work motion, set in action by the key *g* placed in the holes *h* and *i*. The divisions of the barometer plate *b* are in *tenths* of an inch, from 28 to 31 inches; these again subdivided into *hundredths* by means of the *vernier scale*, placed oppositely on a sliding slip of brass similar to the common barometers, most of which are now made with this *vernier*. On this *vernier* are *ten equal parts*, or divisions; (see A, fig. 11. which for the sake of perspicuity is drawn larger). All of these together are equal just to eleven of those on the scale of inches; that is, to eleven-tenths. By this artifice the height of the mercury at E is evident by inspection only, to the one hundredth part of an inch. To understand this, nothing more is necessary than to consider, that *one tenth part of a tenth of an inch* is the *one hundredth part of an inch*. Now every tenth of an inch in the scale B is divided into ten equal parts by the slip or *vernier* A: for since ten divisions on that exceed ten on the scale by one division, that is, by one-tenth of an inch; therefore one division on the *vernier* will exceed one division on the scale by *one tenth part*; and two divisions on the *vernier* will exceed two on the scale by *two tenths*, and so on: Therefore every division on the *vernier* will exceed the same number of divisions on the scale by *so many tenths of a tenth*, or by *so many hundredth parts of an inch*. Therefore the ten equal divisions of an inch on the scale B, must be looked upon as so many *ten hundredth parts of an inch*, and numbered thus, 10. 20. 30. 40. &c. parts of an inch; then the *vernier* gives the unit to each ten, thus: Set the index C very nicely to the top of the surface of the mercury E; and if at the same time the beginning of the divisions at C coincide with a line of division in the scale B, then it shows the altitude of the mercury in *inches and tenths of an inch* exactly. But suppose the index line C of the *vernier* falls *between* two divisions or tenths on the scale B, then there will be a coincidence of lines in both at that number of the *vernier*, which shows how many tenth parts of that tenth the index of the *vernier* has passed the last decimal division of the scale. Thus, for example, suppose the index of the *vernier* were to point somewhere between the sixth and seventh tenth above 30 on the scale: then if, by looking down the *vernier*, you observe the

29
Method of
using the
vernier
scale.

coincidence at number 8, it shows that the altitude of the mercury is 30 inches and 68 parts of a hundredth of another inch; or simply thus, 30.68 inches.

The screw at fig. 10. serves to press the mercury quite up into the tube, when required to be much moved or carried about, thereby rendering the barometer of the kind called *portable*. To the lower extremity of the tube (see fig. 14.) is cemented a wooden reservoir A, with a kind of leathern bag at bottom, the whole containing the mercury, but not quite full: and though the external air cannot get into the bag to suspend the mercury in the tube, by pressing on its surface, as in the common one; yet it has the same effect by pressing on the outside of the bag; which being flexible, yields to the pressure, and keeps the mercury suspended in the tube to its proper height. Thro' the under part of the frame passes the screw *f*, with a flat round plate at its end; by turning of this screw, the bag may be so compressed as to force the mercury up to the top of the tube, which keeps it steady, and hinders the tube from breaking by the mercury dashing against the top when carried about; which it is otherwise apt to do.

A new kind of marine barometer hath lately been invented by Mr Nairne. It differs from the common one in having the bore of the tube small for about two feet in its lower part; but above that height it is enlarged to the common size. Through the small part of the instrument the mercury is prevented from ascending too hastily by the motion of the ship; and the motion of the mercury in the upper wide part is consequently lessened. Much is found to depend on the proper suspension of this instrument; and Mr Nairne has since found, by experiment, the point from which it may be suspended so as not to be affected by the motion of the ship.

Another marine barometer has been invented by one Passemonte, a French artist. It is only a common one having the middle of the tube twisted into a spiral consisting of two revolutions. By this contrivance, the impulses which the mercury receives from the motions of the ship are destroyed by being transmitted in contrary directions.

We must now speak of the barometer in its second character, namely, as an instrument for measuring accessible altitudes. This method was first proposed by M. Pascal; and succeeding philosophers have been at no small pains to ascertain the proportion between the sinking of the mercury and the height to which it is carried. For this purpose, however, a new improvement in the barometer became necessary, viz. the making of it easily portable from one place to another, without danger of its being broken by the motion of the mercury in the tube; which was effected by the contrivance already mentioned.

Among the number of portable barometers we may perhaps reckon what Mr Boyle called his *Statical Barometer*. It consisted of a glass bubble, about the size of a large orange, and blown very thin, so as to weigh only 70 grains. This being counterpoised by brass weights in a pair of scales that would turn with the 30th part of a grain, was found to act as a barometer. The reason of this was, that the surface of the bubble was opposed to a vastly larger portion of air than that

Barometer.

30
Marine ba-
rometer by
Mr Nairne.

31
By Passemonte.

32
Barometer
applied to
the mensu-
ration of
altitudes.

33
Statical ba-
rometer.

Barometer. of the brass weight, and consequently liable to be affected by the various specific gravity of the atmosphere: thus, when the air became specifically light, the bubble descended, and *vice versa*; and thus, he says, he could have perceived variations of the atmosphere no greater than would have been sufficient to raise or lower the mercury in the common barometer an eighth part of an inch.

34
Method of
measuring
the changes
of the air
by the
sound of a
wire.

To these we may add an account of a new and very singular barometer mentioned by M. Lazowski in his tour through Switzerland. "A Cure, shortsighted, who nevertheless amused himself with firing at a mark, thought of stretching a wire in such a manner as to draw the mark to him, in order to see how he had aimed. He observed, that the wire sometimes sounded as if it had been oscillatory; and that this happened when a change was about to ensue in the atmosphere; so that he came to predict with considerable accuracy when there was to be rain or fine weather. On making further experiments, it was observed, that this wire was more exact, and its sounds more distinct, when extended in the plane of the meridian than in other positions. The sounds were more or less soft, and more or less continued, according to the changes of weather that were to follow; though the matter was not reduced to any accuracy, and probably is not capable of much. Fine weather, however, was said to be announced by the sounds of counter tenor, and rain by those of bass. M. Volta was said to have mounted 15 chords at Pavia, in order to bring this method to some perfection; but there are as yet no accounts of his success.

35
Difficulties
in measuring
heights
by the barometer.

The portable barometer, as already observed, has long been in use for the mensuration of accessible altitudes; and, in small heights, was found to be more exact than a trigonometrical calculation, the mercury descending at the rate of about one inch for 800 feet of height to which it was carried: but, in great heights, the most unaccountable differences were found between the calculation of the most accurate observers; so that the same mountain would sometimes have been made thousands of feet higher by one person than another; nay, by the same person at different times. All these anomalies M. de Luc of Geneva undertook to account for, and to remove; and in this undertaking he persisted with incredible patience for 20 years. The result of his labour is as follows.

36
Removed
by M. de
Luc.

The first cause of irregularity observed was a fault in the barometer itself. M. de Luc found, that two barometers, though perfectly alike in their appearance, did not correspond in their action. This was owing to air contained in the tube. The air was expelled by boiling the mercury in them; after which, the motions of both became perfectly consonant. That the tubes may bear boiling, they must not be very thick, the thickness of the glass not above half a line, and the diameter of the bore ought to be from two and an half to three lines. The operation is performed in the following manner: A chafing-dish with burning coals is placed on a table; the tube hermetically sealed at one end, is inverted, and filled with mercury within two inches of the top; the tube is gradually brought near the fire, moving it obliquely up and down, that the whole length of it may be heated; and advancing it nearer and nearer, till it is actually in the flame, the

37
Mercury
how boiled
in the tubes
with the
effects.

globules of air begin to move visibly towards the top. The boiling at last commences; and it is easy to make it take place from one end to the other, by causing the several parts of the tube successively pass with rapidity through the flame. By this operation the mercury is freed from all aerial particles, particularly those which line the inside of the tube, and which cannot easily be got clear of by any other method. When this last stratum of air is discharged, the tube may be afterwards emptied, and filled even with cold mercury, when it will be found nearly as free of air as before. The mercury in the tube thus prepared by a determinate quantity of heat, will rise higher than those in the common sort, and the barometers will more nearly correspond with each other; whereas there will be a difference of six or eight lines in the ascent of mercury in the common barometers. Instruments of this kind rise uniformly in a heated room, whilst those of the common kind descend in different proportions. On cooling the room, the former descend uniformly, while the latter descend unequally, by reason of the unequal proportions of air in them.

The next cause of variation was a difference of temperature. To discover the effects of heat on the mercury, several barometers were chosen that for a long time had been perfectly consonant in their motions. One of these was placed in an apartment by itself, to mark the change in the external air, if any should happen. The rest were situated in another apartment, along with three thermometers, graduated according to the scale of M. de Reaumur, and exactly correspondent with one another. The point at which the mercury stood when the experiment began, was carefully noted, and also the precise height of the thermometers. The latter apartment then was gradually heated; and with so much uniformity, that the thermometers continued still to agree. When the heat had been augmented as much as possible, the altitudes both of the barometers and thermometers were again accurately marked, to ascertain the differences that corresponded to one another. This experiment was repeated several times with next to no variation; and from the barometer in the first apartment it appeared, that no sensible alteration had taken place in the external air. Hence M. de Luc found, that an increase of heat sufficient to raise the thermometer from the point of melting ice to that of boiling water, augments the height of the mercury in the barometer precisely six lines; and, therefore, dividing the distance between these two points on the thermometer into 96 equal parts, there will be $\frac{1}{16}$ th of a line to add to, or subtract from, the height of the mercury in the barometer, for every degree of variation of the thermometer so graduated. A scale of this kind, continued above boiling or below freezing water, accompanies his portable barometer and thermometer.—So accurate, he says, did long practice make him in barometrical observations, that he could distinguish a variation of $\frac{1}{17}$ of a line in the height of the mercury. He allows of no inclination of the tube, or other means to augment the scale, as all these methods diminish the accuracy of the instrument. Two observations are always required to measure the altitude of a mountain: one with a barometer left on the plain, and another on the summit; and both must be accompanied with a thermometer.

38
Variation
of the
height of
the mer-
cury by
heat.

His

Barometer.

39
M. De
Luc's port-
able baro-
meter.

His portable barometer consists of two tubes, one of 34 French inches in length; and from the top, for this length, perfectly straight; but below this, it is bent round, so that the lower end turns up for a short space parallel to the straight part. On this open end is fixed a cock; and on the upper side of this cock is placed another tube, of the same diameter with the former, eight inches in length, open at both ends, and communicating with the long tube, through the cock. When the barometer is carried from one place to another, it is inverted very slowly, to hinder any air getting in; the quicksilver retires into the long tube on which the key of the cock is turned; and to preserve the cock from too great pressure of the mercury, the barometer is conveyed about in this inverted posture. When an observation is to be made, the cock is first opened; the tube is then turned upright, very slowly, to prevent, as much as possible, all the vibration of the mercury, which disturbs the observation; and according to the weight of the atmosphere, the mercury falls in the longer branch, and rises up through the cock into the shorter.

The whole of the cock is made of ivory, except the key. The extremities of the tubes are wrapped round with the membrane employed by the gold-beaters, done over with fish-glue, in order to fix them tight, the one in the lower, and the other in the upper, end of the perpendicular canal of the cock. The part of the key that moves within the cock is of cork, and the outward part or the handle is of ivory. The cork is fastened firmly to the ivory by means of a broad thin plate of steel, which cuts both the ivory and cork, lengthwise, through the centre, and reaches inward to the hole of the key. This plate also counteracts the flexibility of the cork, and makes it obey the motion of the handle, notwithstanding it is very considerably compressed by the ivory, to render it tight. That this compression may not abridge the diameter of the hole of the key, it is lined with a thin hollow ivory cylinder, of the same diameter with the tubes.

On the upper end of the shorter tube is fixed, in the intervals of observation, a kind of funnel, with a small hole in it, which is shut with an ivory stopple. The use of it is to keep the tube clean; to replace the mercury that may have made its way through the cock in consequence of any dilatation; and likewise to replace the mercury taken out of the shorter tube, after shutting the cock, on finishing an observation; because, when the mercury is left exposed to the air, it contracts a dark pellicle on its surface, that sullies both itself and the tube. The shorter tube should be wiped from time to time, by a little brush of sponge fixed on the end of a wire.

The barometer, thus constructed, is placed in a long box of fir, the two ends of which are lined on the inside with cushions of cotton covered with leather. This box may be carried on a man's back, like a quiver, either walking or riding; and should have a cover of wax-cloth to defend it against rain. It should be kept at some distance from the body of the man, and be protected from the sun by an umbrella, when near the place of observation, to prevent its being affected by any undue degree of heat. The barometer should, farther, be attended with a plummet, to determine the

perpendicular position of it; and a tripod, to support it firm in that position at the time of observation.

The scale of the barometer begins on the long tube, at a point on a level with the upper end of the short one; and rises, in the natural order of the numbers, to 21 inches. Below the above point, the scale is transferred to the short tube; and descends on it, in the natural order of the numbers, to 7 inches. The whole length of the scale is 28 French inches; and since, as the mercury falls on the one tube, it must rise in the other, the total altitude will always be found by adding that part of the scale, which the mercury occupies in the long tube, to that part of it which the mercury does not occupy in the short one. In estimating, however, the total fall or rise on the long tube, every space must be reckoned twice; because, of barometers of this construction, half the real variation only appears in one of the branches.

Near the middle of the greater tube is placed the thermometer above mentioned, for ascertaining the corrections to be made on the altitude of the mercury in consequence of any change in the temperature of the air. It is placed about the middle of the barometer, that it may partake as much as possible of its mean heat. The ball is nearly of the same diameter with the tube of the barometer, that the dilatations or condensations of the fluids they contain may more exactly correspond. The scale is divided into 96 parts; between the points of boiling water and melting ice, and the term of 0 is placed one eighth part of this interval above the lower point; so that there are 12 degrees below, and 84 above, it. The reason for placing 0 here is, that as 27 French inches are above the mean height of the barometer, so the 12th degree above freezing is nearly the mean altitude of the thermometer. Hence, by taking these two points, the one for the mean altitude, and the other for the mean heat, there will be fewer corrections necessary to reduce all observations to the same state, than if any higher or lower points had been fixed upon.

If then the barometer remains at 27 inches, and the thermometer at 0, there are no corrections whatever to be made. But if, while the barometer continues at 27 inches, the thermometer shall rise any number of degrees above 0, so many sixteenths of a line must be subtracted from the 27 inches, to obtain the true height of the barometer produced by the weight of the atmosphere, and to reduce this observation to the state of the common temperature. If, on the other hand, the thermometer shall fall any number of degrees below 0, while the barometer still stands at 27 inches, so many sixteenths must be added to that height, to obtain the true altitude.

Nothing is more simple than these corrections, when the barometer is at or near 27 inches of height. If, however, it fall several inches below this point, as the portable barometer very frequently must, the dilatations will no longer keep pace with the degrees of heat, after the rate of $\frac{1}{16}$ of a line for every degree of the thermometer; because the columns of mercury being shortened, the quantity of fluid to be dilated will be diminished. The truth is, the quantity of the dilatations for the same degree of heat is just as much diminished as the column is shortened. If, then, it shall

still

Barometer. Still be found convenient to reckon the dilatations by sixteenths of a line, these sixteenths must be counted on a scale, of which the degrees shall be as much longer than the degrees of the first scale, as the shortened column of mercury is less than 27 inches, the height to which the length of the degrees of the first scale was adapted. For instance, let the mercury descend to $13\frac{1}{2}$ inches half the mean column, and let the thermometer ascend 10 degrees above the mean heat; 10 sixteenths should be deduced from the mean column, for this temperature, according to the rule; but 10 half-sixteenths only, or 5 whole sixteenths, must be subtracted from the column of $13\frac{1}{2}$ inches, because the sum of its dilatations will be half that of the former, the quantities of fluid being to one another in that proportion.

It would cause considerable embarrassment if the sixteenths of correction were always to be subdivided into less fractions, proportional to every half inch of descent of the barometer: and the same end is obtained in a very easy manner, by reckoning the corrections on different scales of the same length, but of which the degrees are longer according as the columns of the barometer are shorter. For example, the degrees of correction on the scale applicable to the column of $13\frac{1}{2}$ inches, will be double in length what the same degrees are for the column of 27 inches; and of course the number of corrections will be reduced likewise one half, which we have seen by the rule they ought to be.

The author constructed, on a piece of vellum, scales with these properties, for no less than 23 columns of mercury, being all those between 18 inches and 29 inclusive, counting from half inch to half inch; within which extremes, every practical case will be comprehended. He wrapped this vellum on a small hollow cylinder, including a spring, like a spring-curtain, and fixed it on the right side of the thermometer. The vellum is made to pass from right to left, behind the tube of the thermometer, and to graze along its surface. The observer, to find the corrections to be made, pulls out the vellum till the scale corresponding to the observed altitude of the barometer comes to touch the thermometer, and on that scale he counts them. The vellum is then let go, and the screw gently furls it up.

40
His operations on the mountain of Saleve.

The author having now, as he imagined, completely finished the instruments necessary for the accurate mensuration of heights; proceeded to establish, by experiment, the altitudes corresponding to the different descents of the mercury. Much had been written, and many rules had been given on this subject, by different eminent philosophers, since the days of Pascal, who first broached it: but these disagreed so much with one another, and presented so little good reason why any one of them should be preferred, that no conclusion could with confidence be deduced from them. It became requisite, therefore, to lay them all aside, and to endeavour to discover by practice what could not be ascertained by theory. Saleve, a mountain near Geneva, was chosen for the scene of these operations. This mountain is near 3000 French feet high. The height of it was twice measured by levelling, and the result of the mensurations differed only $10\frac{1}{2}$ inches; though there intervened six months between them, and the

total altitude was so considerable. On this mountain were chosen no less than 15 different stations, rising after the rate of 200 feet, one above another, as nearly as the ground would admit. At these stations it was proposed to make such a number of observations as might be a good foundation either for establishing a new rule of proportion between the heights of places and the descents of the mercury, or for preferring some one of those formerly discovered.

41
Little progress was made in this plan, when a phenomenon, altogether unexpected, presented itself. The barometer being observed, at one of the stations, twice in one day, was found to stand higher in the latter observation than in the former. This alteration gave little surprise, because it was naturally imputed to a change of the weight of the atmosphere, which would affect the barometer on the plain in the same manner. But it produced a degree of astonishment, when on examining the state of the latter, it was found, instead of corresponding with the motions of the former, to have held an opposite course, and to have fallen while the other rose. This difference could not proceed from any inaccuracy in the observations, which had been taken with all imaginable care; and it was so considerable as to destroy all hopes of success, should the cause not be detected and compensated.

The experiment was repeated several times, at intervals, that no material circumstance might escape notice. An observer on the mountain, and another on the plain, took their respective stations at the rising of the sun, and continued to mark an observation, every quarter of an hour, till it set. It was found, that the lower barometer gradually descended for the first three quarters of the day; after which it reascended, till in the evening it stood at nearly the same height as in the morning. While the higher barometer ascended for the first three fourths of the day; and then descended, so as to regain likewise, about sun-set, the altitude of the morning.

42
The following theory seems to account in a satisfactory manner for this phenomenon. When the sun rises above the horizon of any place, his beams penetrate the whole of the section of the atmosphere of which that horizon is the base. They fall, however, very obliquely on the greater part of it, communicate little heat to it, and consequently produce little dilatation of its air. As the sun advances, the rays become more direct, and the heat and rarefaction of course increase. But the greatest heat of the day is not felt even when the rays are most direct, and the sun is in the meridian. It increases while the place receives more rays than it loses, which it will do for a considerable time after mid-day; in like manner as the tide attains not its highest altitude till the moon has advanced a considerable way to the west of the meridian. The heat of the atmosphere is greatest at the surface of the earth, and seems not to ascend to any great distance above it. The dilatations, for this reason, of the air, produced by the sun, will be found chiefly, if not solely, near the earth. A motion must take place, in all directions, of the adjacent air, to allow the heated air to expand itself. The heated columns extending themselves vertically, will become longer, and at the same time specifically lighter, in consequence of the rarefaction of their inferior parts. The motion of air,

Barometer.

Strange anomalies of the barometer at different times of the day.

Accounted for.

Barometer. air, till it rises into wind, is not rapid: these lengthened columns, therefore, will take some time to dissipate their summits among the adjacent less rarefied columns that are not so high; at least, they will not do this as fast as their length is increased by the rarefaction of their bases.

The reader, we presume, anticipates the application of this theory to the solution of the phenomenon in question. The barometer on the plain begins to fall a little after morning, because the column of air that supports it becomes specifically lighter on account of the rarefaction arising from the heat of the sun. It continues to fall for the first three quarters of the day; because, during that time, the heat, and consequently the rarefaction, are gradually increasing. It rises again, after this period; because the cold, and of course the condensation, coming on, the specific gravity is augmented by the rushing in of the adjacent air. The equilibrium is restored, and the mercury returns to the altitude of the morning.

The barometer on the eminence rises after morning, and continues to do so for three-fourths of the day, for two reasons. The density of the columns of air is greatest near the earth, and decreases as the distance from it increases. The higher, for this reason, we ascend in the atmosphere, we meet with air specifically lighter. But by the rarefaction of the base of the column that supports the mercury of the barometer on the eminence, the denser parts of that column are raised higher than naturally they would be if left to the operation of their own gravity. On this account, the higher barometer is pressed with a weight, nearly as great as it would sustain, were it brought down, in the atmosphere, to the natural place of that denser air now raised above it by the prolongation of the base of the column. The other reason is, that as the rarefaction does not take place at any great distance from the earth, little change is produced in the specific gravity of the portion of the column that presses on the higher barometer, and the summit of that column dissipates itself more slowly than it increases. Thus, we see how this barometer must ascend during the first three fourths of the day, and pursue a course the reverse of that on the plain. The condensations returning after this time, the denser air subsides, the equilibrium takes place, and the mercury descends to its first position.

43
Render another pair of thermometers necessary.

This phenomenon prompted the idea of a second pair of thermometers, to measure the mean heat of the column of air intercepted between the barometers. These thermometers are extremely delicate and sensible. The tubes are the finest capillary, the glass very thin, and the diameters of the balls only three lines. The balls are insulated, or detached from the scales, which are fixed to the tubes only, by ligatures of fine brass-wire covered with silk. The air, by this contrivance, has free communication with the balls on all sides; and, if the direct rays of the sun be intercepted at some distance by a bit of paper, or even the leaf of a tree, the thermometers will quickly mark the true temperature of the air.

44
Method of computing the altitudes.

The reader, perhaps, will ask here, Could not this end have been gained by the first pair of thermometers? But we must request him to suspend his judgment till we have explained the theory of computing

the altitudes from the descents of the mercury. He will then find the scales of these thermometers so different, that neither of them could, without much inconvenience, serve the purpose of the other.

The altitudes are computed by logarithms. A table of logarithms contains two series of numbers, running parallel to one another. The first has its terms in geometrical progression, and the second its terms in arithmetical. The natural numbers, 1, 2, 3, 4, &c. form the first series; which, though in arithmetical progression when standing detached, are in geometrical in regard of the second series; whose terms are in arithmetical progression, and are called *logarithms*, because they express the distance of their correspondent terms of the geometrical progression from the beginning of the series.

To apply this table to the present purpose: let us suppose the whole atmosphere divided into concentric spherical sections, whose common centre is that of the earth. Suppose also all these sections of equal thickness, namely, 12.497 toises, which is found to be the thickness of the lowest section, and balances a line of mercury, when the barometer stands at 348 lines or 29 inches. Add, then, all these sections together; and we shall have the total altitude of the atmosphere expressed in an arithmetical progression, whose common difference is 12.497 toises. Consequently, in this view, the heights are proportioned to the logarithms.

It remains only to find the descents of the mercury, which measures the weights of the respective sections, in geometrical proportion, in order to justify the application of the logarithmic table to the computation of the altitudes. Now, it is easy to prove, in a very satisfactory manner, that the mean densities of these sections, which are in proportion of their weights, must be in geometrical progression, when the altitudes are in arithmetical; consequently, it is with great propriety and convenience that the logarithms are employed in the computation of the altitudes corresponding to the descents of the mercury. For, to find the vertical distance between two barometers, at different heights, no more is necessary than to look, in a table of logarithms, for the numbers that express in lines, or sixteenths of a line, the altitudes of the two columns of mercury, and take the logarithms of these numbers, whose difference will give this distance accurately, in thousandth parts of a toise. Multiply the toises by 6, which will furnish the altitudes in French feet.

The author made about 500 different observations at the several stations on the mountain of Saleve, which both suggested and verified the computation by logarithms. Many, however, of these observations, produced conclusions that deviated considerably from the results of the actual mensuration, on account of the different temperatures in which they were taken. It was the design of the second pair of thermometers to point out the corrections of these deviations. In settling the scales necessary for this end, the first object was, to mark the temperature of all the observations where the logarithms gave the altitudes exactly, or nearly equal to what they were found to be by levelling. This temperature corresponded to 16½ on the scale of Reaumur, and to 70 on that of Fahrenheit, and as it was fixed the term 0. The next step was, to determine the corrections of the heights that became necessary, according

Barometer. ing as the state of the air was warmer or colder than the fixed point. With this view, all the remaining observations were collected, and compared with the different temperatures in which they were taken; and from an attentive examination of these circumstances, it was discovered, that for every 215 feet of height furnished by the logarithms, one foot of correction must be added or subtracted, for every degree of the thermometer, according as it stood above or below the term 0.

The scale of Reaumur did not conveniently express this correction of 1 to 215. The author wished to adopt the ratio of 1 to 1000, in forming a new scale for that purpose; but the divisions would have been too small. He employed, therefore, that of 1 to 500: because, by doubling the degrees of the higher thermometer above or below 0; or, which amounted nearly to the same thing, by doubling the mean heat of the column of air in taking the sum of the degrees of both thermometers, there resulted the ratio of 1 to 1000. The new scale, then, was divided by the following proportion: As 215, the last term of the ratio found by Reaumur's scale, is to 500, the last term of the ratio to be applied on the new scale; so is 80, the parts between the fixed points of the first scale, to 186, the number of parts between the same points on the second. And as 80 is to 186; so is $16\frac{1}{2}$, the point on Reaumur's scale at which the logarithms give the altitudes without correction, to 39, the point at which they give them on the new scale. The term 0 is placed at this point, 39 at melting ice, and 147 at that of boiling water. To reduce all observations to the same temperature by this scale, nothing more is necessary than to multiply the heights found from the logarithms by the sum of the degrees of both thermometers above or below 0, and to divide the product by 1000. The quotient must be added to, or subtracted from, the logarithmic height, according as the temperature is positive or negative.

45
Specimen
of this method
of mensuration.

As a specimen of the author's method, we shall now present our reader's with the result of his operations at the 15 stations on Saleve. In one column are marked the heights found by levelling, and opposite to them the same heights found by the barometer; to the latter are prefixed the number of observations of which they are the mean.

Stations.	Heights by levelling.		Number of observations.	Heights by barometer.
	feet.	inches.		feet.
1	216	2	12	230 $\frac{3}{4}$
2	428	10	13	435 $\frac{1}{3}$
3	586	0	13	591 $\frac{1}{3}$
4	728	8	21	732 $\frac{1}{7}$
5	917	0	24	919 $\frac{1}{2}$
6	1218	8	27	1221 $\frac{1}{7}$
7	1420	0	23	1418 $\frac{1}{3}$
8	1800	0	17	1798 $\frac{1}{7}$
9	1965	3	17	1962 $\frac{2}{7}$
10	2211	0	17	2210
11	2333	0	17	2331 $\frac{5}{7}$
12	2582	4	16	2583 $\frac{1}{3}$
13	2700	0	15	2703 $\frac{6}{13}$
14	2742	0	10	2741 $\frac{1}{3}$
15	2926	0	11	2924 $\frac{10}{11}$

From this table we presume the reader will be in-

clined to entertain the most favourable opinion of the abilities and industry of M. de Luc. Notwithstanding the amazing pains, however, which he has taken to remove every inaccuracy in the barometer, it did not remain entirely free from error; nor in many instances have the observations made by different persons exactly corresponded. Considerable improvements have been suggested by Col. Roy and Sir George Shuckburgh, &c. (see *Phil. Trans.* vol. 67. and 68.); and put in execution, with improvements, by Mr Ramsden, and other ingenious instrument-makers in London. The following is a description of a very portable one constructed by Mr William Jones of Holborn, which, from its principle, comprehends every advantage that M. de Luc's instrument possesses; in many particulars is exempted from the errors to which his is liable; and is not subject to be deranged by carriage or other motion.

Fig. 12. is a representation of the instrument as inclosed in its mahogany case by means of three metallic rings *bbb*: This case is in the form of an hollow cone divided into three arms or legs from *a* to *c*, and is so carved in the inside as to contain steadily the body of the barometer: The arms, when separated, form three firm legs or supports for the barometer when making observations (see fig. 13.): The instrument is suspended at the part *g* of the case, by a kind of improved gimbals; and therefrom, with its own weight, is sufficiently steady in exposed weather. In that part of the frame where the barometer tube is seen (*ae*), there is a long slit or opening made, so that the altitude of the mercury may be seen against the light, and the vernier piece *a* brought down to coincide with the edge of the mercury to the greatest possible exactness. When the instrument is placed on its support, the screw *f* is to be let down in order that the mercury may subside to its proper height; and also a peg at *p* must be loosened, to give admission to the action of the external air upon the mercury contained in the box *b*. The adjustment or mode of observing what is called the zero, or 0, division of the column of mercury, is by the mercury being seen in the transparent part of the box *b*; the inside of which is a glass tube or reservoir for the mercury, and an edged piece of metal fixed on the external part of the box. The mercury is to be brought into contact with the edge by turning the screw *f* towards the right or left as necessary. The vernier piece at *a* that determines the altitude of the column of mercury, is to be brought down by the hand to a near contact, and then accurately adjusted by turning the screw *b* at top of the instrument. This barometer has usually two different sorts of scales inserted on it: that on the right at *ae*, is a scale of French inches from 19 to 31, measured from the surface or zero of the mercury in the box *b* below, divided into 12th parts or lines, and each line subdivided by the vernier into 10 parts, so that the height of the column of mercury may be ascertained to the 120th part of a French inch. The scale which is on the other side, or left of observation, is of the same length; but divided into English inches, each of which is subdivided into 20ths of an inch, and the vernier subdivides each 20th into 25 parts; so that the height of the mercury is hereby ascertained to the 500th part of an English inch (viz. $20 \times 25 = 500$). But this vernier is figured double for the convenience of calculation, viz. The first 5 divisions are marked 10, the

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Description
of the most
improved
barometer
yet invent-
ed.

Barometer. the 20 marked 40, and the 25 marked 50: then each exact division is reckoned as the *two thousandths* of an inch, which amounts to the same; for $\frac{1}{500}$ is the same in value as $\frac{2}{1000}$ of an inch. A *thermometer* is always attached to the barometer, and indeed is indispensably necessary: it is fastened to the body at *c*, counterfunk beneath the surface of the frame, which makes it less liable to be broken: the degrees of the thermometer are marked on two scales, one on each side, viz. that of Fahrenheit and Reaumur, scales generally known; the freezing point of the former being at 32 and the latter at 0. On the right-hand side of these two scales there is a third, called a scale of *correction*; it is placed oppositely to that of Fahrenheit, with the words *add* and *subtract*: it serves as a necessary correction to the observed altitude of the mercury at any given temperature of the air shown by the thermometer. There are several other valuable pieces of mechanism about the instrument that cannot clearly be represented in the figure; but what has already been said, we presume, is sufficient for the reader's general information. For the manner of making the necessary observations, and calculating the necessary particulars deducible therefrom, a full information may be obtained from M. De Luc, *Recherches sur les Modifications de l'Atmosphere*, and the Philosophical Transactions, vol. 67. and 68. before cited.

It may be necessary to add here, that by very small additional contrivances to this instrument, Mr Jones renders it equally useful for making observations at sea with any *marine* barometer that has hitherto been invented.

This article may not be improperly concluded by an observation of Mr Magellan*, relative to a principal cause of error in barometrical measurements. This he states to be owing to the inattention of observers to the *specific gravity* of the mercury with which their barometers were made. "If two barometers were both at 30 inches high, and equally circumstanced in every other respect, excepting only their specific gravity of the quicksilver; so that one be filled with the first kind I have tried, viz. whose specific gravity was = 13,62 and the other = 13,45. In this case, and in all probability many of this kind have often occurred, the error must have been no less than 327 feet; because the heights of the mercurial columns in each barometer must be in the inverse ratio of their specific gravities: viz. 13,45 : 1362 :: 30 : 30,379.

Now the logarithm of 30 = 4771,21

ditto of 30,379 = 4825,73

the difference is = 54.52

which difference shows, that there are 54.52 fathoms between one place and another, or 327 feet; though in reality both places are on the same level.

"But if the specific gravity of the mercury, in the two barometers, were as the two above alluded to of Bergman and Fourcroy; viz. one of 14,110, and the other of 13,000, which may happen to be the case, as the heaviest is commonly reputed the purest mercury; on this supposition the error must have amounted to 35,576 toises, or above 2134 feet and a half; because 13,000 : 14,110 :: 30 : 32,561.

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Now the logarithm of 30 = 4771,21
and that of 32,561 = 5126,97

Barom.

the difference is = 355,76; which shows that the error should amount to so many fathoms, or 2134,5 feet.

BARON, a person who holds a barony. The origin and primary import of this term is much contested. Menage derives it from the Latin *baro*, which we find used in the pure age of that language for *vir*, a *stout* or *valiant man*; whence, according to this author, it was, that those placed next the king in battles were called *barones*, as being the bravest men in the army; and as princes frequently rewarded the bravery and fidelity of those about them with fees, the word came to be used for any noble person who holds a fee immediately of the king. Isidore, and after him Camden, take the word, in its original sense, to signify a *mercenary soldier*. Messieurs of the Port Royal derive it from *βασις*, *weight* or *authority*. Cicero uses the word *baro* for a stupid brutal man; and the old Germans make mention of *buffeting a baron*, i. e. a *villain*; as the Italians still use the word *barone* to signify a *beggar*. M. de Marca derives baron from the German *bar*, *man*, or *freeman*; others derive it from the old Gaulish, Celtic, and Hebrew languages; but the most probable opinion is, that it comes from the Spanish *varo*, a *stout*, *noble person*; whence wives used to call their husbands, and princes their tenants, *barons*. In the Salic law, as well as the laws of the Lombards, the word *baron* signifies a *man* in the general; and the old glossary of Philomenes translates baron by *avnp man*.

BARON is more particularly used, among us, for a lord or peer of the lowest class; or a degree of nobility next below that of a viscount, and above that of a knight or a baronet. In ancient records the word *baron* included all the nobility of England, because regularly all noblemen were barons, though they had also a higher dignity. But it hath sometimes happened, that, when an ancient baron hath been raised to a new degree of peerage, in the course of a few generations the two titles have descended differently; one perhaps to the male descendants, the other to the heirs general; whereby the earldom or other superior title hath subsisted without a barony: and there are also modern instances, where earls and viscounts have been created without annexing a barony to their other honours: so that now the rule doth not hold universally that all peers are barons.

The original and antiquity of barons has occasioned great inquiries among our English antiquarians. The most probable opinion is supposed to be, that they were the same with our present lords of manors; to which the name of *court baron* (which is the lord's court, and incident to every manor) gives some countenance. It is said the original name of this dignity in England was *vavassour*, which by the Saxons was changed into *thane*, and by the Normans into *baron*. It may be collected from king John's *magna charta*, that originally all lords of manors, or barons, had seats in the great council or parliament; but such is the deficiency of public records, that the first precept to be found is of no higher date than the 49th year of king Henry III.; which, although it was issued

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* Magellan's edition of Cronstadi's Mineralogy, notes on Mercury.

Baron.

fued out in the king's name, was neither by his authority nor by his direction: for, not only the king himself, but his son Prince Edward, and most of the nobility who stood loyal to him, were then prisoners in the hands of the rebellious barons; having been so made in the month of May preceding, at the battle of Lewes, and so continued until the memorable battle of Evesham, which happened in August the year following; when, by the happy escape of Prince Edward, he rescued the king and his adherents out of the hands of Simon Mountfort earl of Leicester. It cannot be doubted but that several parliaments were held by king Henry III. and king Edward I.; yet no record is to be found giving any account thereof (except the 5th of king Edward I.), until the 22d year of the reign of the last mentioned king.

Before the 49th of Hen. III. the ancient parliaments consisted of the archbishops, bishops, abbots, earls, and barons. Of these barons there were two sorts: the *greater barons*, or the king's chief tenants, who held of him *in capite* by barony; and the *lesser barons*, who held of the first by military service *in capite*. The former had summons to parliament by several writs; and the latter (*i. e.* all those who were possessed of thirteen knights fees and a quarter) had a general summons from the sheriff in each county. Thus things continued till the 49th of Henry III. But then, instead of keeping to the old form, the prevailing powers thought fit to summon, not all, but only those of the greater barons who were of their party; and, instead of the lesser barons who came with large retinues, to send their precepts to the sheriff of each county, to cause two knights in every shire to be chosen, and one or two burgesses for each borough, to represent the body of the people residing in those counties and boroughs; which gave rise to the separation into two houses of parliament. By degrees the title came to be confined to the greater barons, or lords of parliament only; and there were no other barons among the peerage but such as were summoned by writ, in respect of the tenure of their lands or baronies, till Richard II. first made it a mere title of honour by conferring it on divers persons by his letters patent. See further LAW, Part III. N^o clviii. 12, 13, 14.

When a baron is called up to the house of peers by writ of summons, the writ is in the king's name, and he is directed to come to the parliament appointed to be held at a certain time and place, and there to treat and advise with his majesty, the prelates, and nobility, about the weighty affairs of the nation. The ceremony of the admission of a baron into the house of peers is thus: He is brought into the house between two barons, who conduct him up to the Lord Chancellor, his patent or writ of summons being carried by a king at arms, who presents it kneeling to the Lord Chancellor, who reads it, and then congratulates him on his becoming a member of the house of peers, and invests him with his parliamentary robe. The patent is then delivered to the clerk of the parliament, and the oaths are administered to the new peer, who is then conducted to his seat on the barons bench. Some barons hold their seats by tenure. The first who was raised to this dignity by patent was John de Beauchamp of Holt Castle, created baron of Kidderminster in Worcestershire, to him and his heirs-male, by king Richard II. in the 11th year of his reign. He

invested him with a mantle and cap. The coronation-robcs of a baron are the same as an earl's, except that he has only two rows of spots on each shoulder. In like manner, his parliamentary robes have but two guards of white fur, with rows of gold lace. In other respects they are the same as other peers. King Charles II. granted a coronet to the barons. It has six pearls, set at equal distances on the chaplet. His cap is the same as a viscount's. His style is *Right Honourable*; and he is styled by the king or queen, *Right Trusty and Well beloved*.

BARONS by ancient tenure were those who held by certain territories of the king, who still reserved the tenure in chief to himself. We also read of *barons* by temporal tenure; who are such as hold honours, castles, manors, as heads of their barony, that is by grand sergeanty; by which tenure they were anciently summoned to parliament. But at present a baron by tenure is no lord of parliament till he be called thither by writ.

The barons by tenure after the conquest, were divided into *maiores* and *minores*, and were summoned accordingly to parliament; the *maiores* or greater barons, by immediate writ from the king; the *minores*, or lesser barons, by general writ from the high sheriff, at the king's command.

Anciently they distinguished the greater barons from the less, by attributing high, and even sovereign jurisdiction, to the former, and only inferior jurisdiction over smaller matters to the latter.

BARONS of the *Exchequer*, the four judges to whom the administration of justice is committed, in causes between the king and his subjects relating to matters concerning the revenue. They were formerly barons of the realm, but of late are generally persons learned in the laws. Their office is also to look into the accounts of the king, for which reason they have auditors under them. See EXCHEQUER.

BARONS of the *Cinque-ports* are members of the house of commons, elected by the five ports, two for each port. See the article CINQUE-PORTS.

BARON and *Feme*, in the English law, a term used for husband and wife, in relation to each other: and they are deemed but one person; so that a wife cannot be witness for or against her husband, nor he for or against his wife, except in cases of high treason.

BARON and *Feme*, in heraldry, is when the coats of arms of a man and his wife are borne par pale in the same escutcheon, the man's being always on the dexter side, and the woman's on the sinister; but here the woman is supposed not an heiress, for then her coat must be borne by the husband on an escutcheon of pretence.

BARON (Robert), a dramatic author, who lived during the reign of Charles I. and the protectorship of Oliver Cromwell. He received the earlier parts of his education at Cambridge, after which he became a member of the honourable society of Gray's Inn. During his residence at the university, he wrote a novel called the *Cyprian Academy*, in which he introduced the two first of the dramatic pieces mentioned below. The third of them is a much more regular and perfect play, and was probably written when the author had attained a riper age. The names of them are, 1. *Deorum Dona*, a masque. 2. *Gripus and Hegio*, a pastoral. 3. *Mirza*, a tragedy. Mr Baron had a great intimacy with the celebrated Mr James Howell, the great traveller, in whose collections of Letters * there

Barons,
Baron.

Baron
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Baronets.

is one to this gentleman, who was at that time at Paris. To Mr Howell in particular, and to all the ladies and gentlewomen in England in general, he has dedicated his romance.

BARON (Michael), an excellent comedian of Paris, was the son of Michael Baron another comedian, who was a native of Issoudun. He wrote some poems, and several theatrical pieces, which are printed together in 2 vols 12mo. He died at Paris in 1729, aged 77.

BARONET, a dignity or degree of honour next beneath a baron, and above a knight; having precedence of all knights excepting those of the garter, and being the only knighthood that is hereditary.

The dignity of baronet is given by patent, and is the lowest degree of honour that is hereditary. The order was founded by King James I. at the suggestion of Sir Robert Cotton, in 1611, when 200 baronets were created at once; to which number it was intended they should always be restrained: but it is now enlarged at the king's pleasure, without limitation.

They had several considerable privileges given them, with an *habendum* to them and their heirs male. They were allowed to charge their coat with the arms of Ulster, which are, in a field argent, a sinister hand, gules; and that upon condition of their defending the province of Ulster in Ireland against the rebels, who then harassed it extremely: to which end they were each to raise and keep up 30 soldiers at their own expence for three years together, or to pay into the exchequer a sum sufficient to do it; which, at 8d. per day per head, was L. 1095. So that, including fees, the expence of this dignity may be about L. 1200 Sterling. To be qualified for it, one must be a gentleman born, and have a clear estate of L. 1000 *per annum*.

Baronets take place according to the dates of their patents; by the terms of which no honour is to be erected between barons and baronets. The title *Sir* is granted them by a peculiar clause in their patents, tho' they be not dubbed knights: but both a baronet, and his eldest son, being of full age, may claim knighthood. —The first baronet who was created was Sir Nicholas Bacon of Redgrave in Suffolk, whose successor is therefore styled *Primus Baronetorum Angliæ*.

BARONETS of Scotland; called also *Baronets of Nova Scotia*. The order of knights-baronets was also designed to be established in Scotland in the year 1621, by King James I. for the plantation and cultivation of the province of Nova Scotia in America; but it was not actually instituted till the year 1625 by his son Charles I. when the first person dignified with this title was Sir Robert Gordon of Gordonstone, a younger son of the Earl of Sutherland. The king granted a certain portion of land in Acadia, or New Scotland, to each of them, which they were to hold of Sir William Alexander (afterwards Earl of Stirling), for their encouragement who should hazard their lives for the good and increase of that plantation, with precedence to them and their heirs-male for ever before all knights called *equites aurati*, and all lesser barons called *lairds*, and all other gentlemen, except Sir William Alexander his majesty's lieutenant in Nova Scotia, his heirs, their wives and children; that the title of *Sir* should be prefixed to their Christian name, and *Baronet* added to their surname; and that their own and their eldest sons wives should enjoy the title of *Lady, Madame, or Dame*.

Baronets,
Baroni.

—His majesty was so desirous of adding every mark of dignity to this his favourite order, that, four years after its institution, he issued a royal warrant, granting them the privilege of wearing an orange ribbon and a medal; which last was presented to each of them by the king himself, according to the words of the warrant. All the privileges of the order, particularly this of wearing the medal, were confirmed at the king's request by the convention of estates in the year 1630; and in order to establish them on the most solid foundation, they were again confirmed by an act of the parliament of Scotland in the year 1633. This mark of distinction fell to the ground with all the other honours of Scotland during the usurpation of the long parliament and of Oliver Cromwell. It continued in general, though not total, disuse, after the Restoration. There have been former meetings of the order to revive the use of it, one in the year 1721 and another in 1734. These meetings proved ineffectual, because the proper steps towards its revival were not taken; but, under the auspices of our illustrious monarch George III. such measures were concerted in the year 1775 as have effectually established this honourable dignity.

BARONETS of Ireland. This order was likewise instituted by King James I. in the 18th year of his reign, for the same purpose and with the same privileges within the kingdom of Ireland as he had conferred on the like order in England; for which the Irish baronets paid the same fees into the treasury of Ireland. The first of that kingdom who was advanced to this hereditary dignity was Sir Francis Blundell, then secretary for the affairs of Ireland. Since his time, several have been created, no number being limited.

BARONI (Leonora), a celebrated singer and composer, was born at Naples, but spent the greatest part of her life at Rome. She was daughter of Adriana Baroni of Mantua, baroness of Pian-caretta; a lady also distinguished for her musical talents, and for her beauty furnished *the fair*. Leonora had less beauty than her mother; but excelled her in her profound skill in music, the fineness of her voice, and the charmingness of her manner. She is said by Mr Bayle to have been one of the finest singers in the world. She was, as well as her mother, celebrated by the wits, who strove to excel each other in recording her praises; and in 1639 there was published, at Bracciano, a collection of Latin, Greek, Italian, Spanish, and French poems made upon her, under this title, *Applausi Poetici alle Glorie della Signora Leonora Baroni*. Among the Latin poems of Milton are no fewer than three intitled *Ad Leonoram Romæ canentem*, wherein this lady is celebrated for her singing, with an allusion to her mother's exquisite performance on the lute. A fine eulogium on this accomplished woman is contained in a discourse on the Music of the Italians, printed with the life of Malherbe, and some other treatises at Paris, 1672, in 12mo. This discourse was composed by Mr Maugars prior of St Peter de Mac, the king's interpreter of the English language, and besides so famous a performer on the viol, that the king of Spain and several other sovereign princes of Europe desired to hear him. The character given by this person of Leonora Baroni is as follows: "She is endowed with fine parts; she has a very good judgment to distinguish good from bad music; she understands it perfectly well; and even composes, which

Baronius;
Barony.

makes her absolute mistress of what she sings, and gives her the most exact pronunciation and expression of the sense of her words. She does not pretend to beauty, neither is she disagreeable or a coquet. She sings with a bold and generous modesty, and an agreeable gravity: her voice reaches a large compass of notes, and is exact, loud, and harmonious; she softens and raises it without straining or making grimaces. Her raptures and sighs are not lascivious; her looks having nothing impudent, nor does she transgress a virgin modesty in her gestures. In passing from one key to another, she shows sometimes the divisions of the enharmonic and chromatic kind with so much art and sweetness, that every body is ravished with that fine and difficult method of singing. She has no need of any person to assist her with a theorbo or viol, one of which is necessary to make her singing complete; for she plays perfectly well herself on both these instruments. In short, I have had the good fortune to hear her sing several times above 30 different airs, with second and third stanzas composed by herself. I must not forget to tell you, that one day she did me the particular favour to sing with her mother and her sister. Her mother played upon the lute, her sister upon the harp, and herself upon the theorbo. This concert, composed of three fine voices, and of three different instruments, so powerfully transported my senses, and threw me into such raptures, that I forgot my mortality, and thought myself already among the angels enjoying the felicity of the blessed."

BARONIUS (Cæsar), a pious and learned cardinal, was born at Sora in 1538. He studied at Rome, and put himself under the discipline of St Philip de Neri. In 1593 he was made general of the congregation of the Oratory by the resignation of the founder Philip de Neri. Pope Clement VIII. made him his confessor, and created him a cardinal in 1596. He was afterwards made librarian to the Vatican; and died in 1605, at 68 years of age. He wrote several works; the principal of which is his *Annales Ecclesiastici*, from A. D. 1 to 1198, in 12 vols folio; which has been abridged by several persons, particularly by Henry Spondæus, Bzovius, and Ludovico Aurelio.

BARONY, BARONIA, or *Baronagium*, the lordship or fee of a baron, either temporal or spiritual: In which sense *barony* amounts to the same with what is otherwise called *honour*.

A barony may be considered as a lordship held by some service in chief of the king, coinciding with what is otherwise called *grand serjeanty*. Baronies, in their first creation, moved from the king himself, the chief lord of the whole realm, and could be holden immediately of no other lord. For example, the king enfeoffed a man of a great seigneurie in land, to hold to the person enfeoffed and his heirs, of the king and his heirs, by baronial service; to wit, by the service of 20, 40, 60 knights, or of such other number of knights, either more or fewer, as the king by his enfeoffment limited or appointed.—In the ages next after the Conquest, when a great lord was enfeoffed by the king of a large seigneurie, such seigneurie was called a *barony*, but more commonly an *honour*; as, the honour of Gloucestershire, the honour of Wallingford, the honour of Lancaster, the honour of Richmond, and the like. There were in England certain honours, which

were often called by Norman or other foreign names; that is to say, sometimes by the English and sometimes by the foreign name. This happened when the same person was lord of an honour in Normandy, or some other foreign country, and also of an honour in England. For example, William de Forz, de Force, or de Fortibus, was lord of the honour of Albemarle in Normandy: he was also lord of two honours in England; to wit, the honour of Holderness, and the honour of Skipton in Cravene. These honours in England were sometimes called by the Norman name, the honour of Albemarle, or the honour of the Earl of Albemarle. In like manner, the Earl of Britannie was lord of the honour of Britannie in France, and also of the honour of Richmond in England: the honour of Richmond was sometimes called by the foreign name, the honour of Britannie, or the honour of the Earl of Britannie. This serveth to explain the terms "honour of Albemarle in England," *honor Albemariae*, or *comitis Albemariae in Anglia*; *honor Britanniae*, or *comitis Britanniae in Anglia*, "the honour of Britannie," or "the Earl of Britannie in England." Not that Albemarle or Britannie were in England, but that the same person respectively was lord of each of the said honours abroad and of each of the said honours in England. The baronies belonging to bishops are by some called *regalia*, as being held solely on the king's liberality. These do not consist in one barony alone, but in many; for *tot erant baroniae, quot majora prædia*.

A barony, according to Bracton, is a right indivisible. Wherefore, if an inheritance be to be divided among coparceners, though some capital messuages may be divided, yet if the capital messuage be the head of a county or barony, it may not be parcelled: and the reason is, lest by this division many of the rights of counties and baronies by degrees come to nothing, to the prejudice of the realm, which is said to be composed of counties and baronies.

BARRA, or BARA, island of. See BARA.

BARRA, in commerce, a long-measure used in Portugal and some parts of Spain, to measure woollen cloths, linen cloths, and ferges. There are three sorts; the barra of Valencia, 13 of which make 12 $\frac{6}{7}$ yards English measure; the barra of Castile, 7 of which make 6 $\frac{1}{2}$ yards; and the barra of Aragon, 3 of which make 2 $\frac{1}{2}$ yards English.

BARRABA (defart of); a tract of land in Siberia, lying between the rivers Irtis and Oby, in the province of Tobolsk. It is uninhabited, but not thro' any deficiency of the soil; for that is excellent for tillage, and part of it might also be laid out in meadows and pastures. It is interspersed with a great number of lakes, which abound with a species of carp called by the neighbouring people *karawtschen*; and the country produces great numbers of elks, deer, foxes, ermine, and squirrels. Between the Irtis and Oby are some rich copper-mines; particularly on a mountain called *Pidowa*, from the *pidla* or white firs that grow upon it. Every hundred weight of the ore found here yields 12 pounds of pure copper; and there is no occasion for digging deep in order to come at it. Most of these ores, besides being very rich in copper, yield a great deal of silver, which affords so much gold as makes rich returns for the trouble and expence of extracting it.

Barony
||
Barraba.

Barracan
||
Barrel.

BARRACAN, in commerce, a sort of stuff, not diapered, something like camblet, but of a coarser grain. It is used to make cloaks, furtouts, and such other garments, to keep off the rain.—The cities where the most barracans are made in France are Valenciennes, Lille, Abbeville, Amiens, and Roan. Those of Valenciennes are the most valued: they are all of wool, both the warp and the woof.

BARRACIDA, in ichthyology, a species of pike. See *Esox*.

BARRACKS, or **BARACKS**, places for soldiers to lodge in, especially in garrisons.—Barracks, when damp, are greatly prejudicial to the health of the soldiers lodged in them; occasioning dysenteries, intermitting fevers, coughs, rheumatic pains, &c. For which reason, quarter-masters ought to be careful in examining every barrack offered by the magistrates of a place; rejecting all ground-floors in houses that have either been uninhabited, or have any signs of moisture.

BARRATOR, or **BARRETOR**, in law, a person guilty of barratry. See **BARRETRY**.

Lambert derives the word *barretor* from the Latin *balatro*, “a vile knave;” but the proper derivation is from the French *barrateur*, *i. e.* “a deceiver;” and this agrees with the description of a common barretor in my Lord Coke’s report, *viz.* that he is a common mover and maintainer of suits in disturbance of the peace, and in taking and detaining the possession of houses and lands or goods by false inventions, &c. And therefore it was adjudged that the indictment against him ought to be in these words, *viz.* That he is *communis malefactor, calumniator, et seminator litium et discordiarum inter vicinos suos, et pacis regis perturbator*, &c. And there it is said that a common barretor is the most dangerous oppressor in the law, for he oppresses the innocent by colour of law, which was made to protect them from oppression.

BARRATRY, in law. See **BARRETRY**.

BARRATRY, in a shipmaster, is his cheating the owners. If goods delivered on ship-board are embezzled, all the mariners ought to contribute to the satisfaction of the party that lost his goods, by the maritime law; and the cause is to be tried in the admiralty. In case where a ship was insured against the barratry of the master, &c. and the jury found that the ship was lost by the fraud and negligence of the master, the court agreed, that the fraud was barratry, though not named in the covenant; but that negligence was not.

BARRAUX, a fortress of Dauphiny, belonging to France. It stands in the valley of Gressivaudan, and was built by a Duke of Savoy in 1597. The French took it in 1598, and have kept it ever since. It is seated on the river Iser, in E. Long. 4. 35. N. Lat. 45. 0.

BARRAY, one of the Hebrides, or Western Isles of Scotland, situated in W. Long. 6. 30. N. Lat. 56. 55.

BARRE (Louis Francois Joseph de la), of Tournay, author of several works printed at Paris. Amongst others, *Imper. Orientale, Recueil des Medailles des Empereurs*, “Memoirs for the history of France, &c. He died in 1738.

BARREL, in commerce, a round vessel, extending more in length than in breadth, made of wood, in

form of a little tun. It serves for holding several sorts of merchandize.

BARREL is also a measure of liquids. The English barrel, wine measure, contains the eight part of a tun, the fourth part of a pipe, and one half of a hogshead; that is to say, it contains $31\frac{1}{2}$ gallons: a barrel, beer-measure, contains 36 gallons; and ale-measure 32 gallons. The barrel of beer, vinegar, or liquor preparing for vinegar, ought to contain 34 gallons, according to the standard of the ale-quart.

BARREL also denotes a certain weight of several merchandizes, which differs according to the several commodities. A barrel of Essex butter weighs 106 pounds; and of Suffolk butter, 256 pounds. The barrel of herrings ought to contain 32 gallons wine-measure, which amount to about 28 gallons old standard, containing about 1000 herrings. The barrel of salmon must contain 42 gallons; the barrel of eels the same. The barrel of soap must weigh 256 lb.

BARREL, in mechanics, a term given by watch-makers to the cylinder about which the spring is wrapped; and by gunsmiths to the cylindrical tube of a gun, pistol, &c. through which the ball is discharged.

BARREL, in anatomy, a pretty large cavity behind the tympanum of the ear, about four or five lines deep, and five or six wide.

Fire BARRELS. See *FIRE-Ship*.

Thundering BARRELS, in the military art, are filled with bombs, grenades, and other fire-works to be rolled down a breach.

BARRENESS, the same with sterility. See **STERILITY**.

BARRETRY, in law, is the offence of frequently exciting and stirring up suits and quarrels between his majesty’s subjects, either at law or otherwise. The punishment for this offence, in a common person, is by fine and imprisonment: but if the offender (as is too frequently the case) belongs to the profession of the law, a barretor who is thus able as well as willing to do mischief ought also to be disabled from practising for the future. And indeed it is enacted by statute 12 Geo. I. c. 29. that if any one, who hath been convicted of forgery, perjury, subordination of perjury, or common barratry, shall practise as an attorney, solicitor, or agent, in any suit; the court, upon complaint, shall examine it in a summary way; and, if proved, shall direct the offender to be transported for seven years. Hereunto also may be referred another offence, of equal malignity and audaciousness; that of suing another in the name of a fictitious plaintiff, either one not in being at all, or one who is ignorant of the suit. This offence, if committed in any of the king’s superior courts, is left, as a high contempt, to be punished at their discretion: but in courts of a lower degree, where the crime is equally pernicious, but the authority of the judges not equally extensive, it is directed by statute 8 Eliz. c. 2. to be punished by six months imprisonment, and treble damages to the party injured.

BARRICADE, or **BARRICADO**, a military term for a fence formed in haste with vessels, baskets of earth, trees, pallisades, or the like, to preserve an army from the shot or assault of the enemy.—The most usual materials for barricades consist of pales or stakes, crossed

Barrel
||
Barricade.

Barricade
||
Barrister.

crossed with batons, and shod with iron at the feet, usually set up in passages or breaches.

BARRICADE, in naval architecture, a strong wooden rail, supported by stanchions, extending across the foremost part of the quarter-deck. In a vessel of war, the vacant spaces between the stanchions are commonly filled with rope-matts, cork, or pieces of old cable; and the upper part, which contains a double rope-netting above the rail, is stuffed with full hammocks to intercept the motion, and prevent the execution of small-shot in time of battle.

BARRIER, in fortification, a kind of fence made at a passage, retrenchment, &c. to stop up the entry thereof. It is composed of great stakes, about four or five feet high, placed at the distance of eight or ten feet from one another, with transoms, or overthwart rafters, to stop either horse and foot, that would enter or rush in with violence: in the middle is a moveable bar of wood, that opens or shuts at pleasure. A barrier is commonly set up in a void space, between the citadel and the town, in half-moons, &c.

BARRIERS, signifies that which the French call *jeu de barres*, i. e. *palestra*; a martial exercise of men armed and fighting together with short swords, within certain bars or rails which separated them from the spectators: it is now disused in this country.

BARRING A VEIN, in farriery, an operation performed upon the veins of a horse's legs, and other parts of his body, with intent to stop the course, and lessen the quantity, of the malignant humours that prevail there.

BARRINGTON. See **SHUTE**.

BARRINGTONIA, in botany; a genus of the polyandria order, belonging to the monadelphia class of plants, the characters of which are: one female, the calyx dephyllous above; with a drupa, which it crowns, and the seed is a quadrilocular nut. There is but one species known, the *speciosa*, a native of China and Otaheite.

BARRISTER, is a counsellor learned in the law, admitted to plead at the bar, and there to take upon him the protection and defence of clients. They are termed *jurisconsulti*; and in other countries called *licentia in jure*: and anciently barristers at law were called *apprentices* of the law, in Latin *apprenticii juris nobiliores*. The time before they ought to be called to the bar, by the ancient orders, was eight years, now reduced to five; and the exercises done by them (if they were not called *ex gratia*) were twelve grand moots performed in the inns of Chancery in the time of the grand readings, and 24 petty moots in the term times, before the readers of the respective inns; and a barrister newly called is to attend the six (or four) next long vacations the exercise of the house, *viz.* in Lent and Summer, and is thereupon for those three (or two) years styled a *vacation barrister*. Also they are called *utter barristers*, i. e. pleaders *ouster* the bar, to distinguish them from benchers, or those that have been readers, who are sometimes admitted to plead

within the bar, as the king, queen, or prince's counsel are.

Barritus
||
Barrow.

BARRITUS is a word of German original, adopted by the Romans to signify the general shout usually given by the soldiers of their armies on their first encounter after the *clasticum* or alarm. This custom, however, of setting up a general shout was not peculiar to the Romans, but prevailed amongst the Trojans according to Homer, amongst the Germans, the Gauls, Macedonians, and Persians. See **CLASSICUM**.

BARROS (John), a celebrated Portuguese historian, born at Visco in 1496. He was educated at the court of King Emanuel, among the princes of the blood, and made a great progress in Greek and Latin. The Infant John, to whom he attached himself, and became preceptor, having succeeded the king his father in 1521, Barros obtained a place in this prince's household; and in 1522, was made governor of St George del Mina, on the coast of Guinea. Three years after the king having recalled him to court, made him treasurer of the Indies, and this post inspired him with the thought of writing this history, for which purpose he retired to Pompas, where he died in 1570. His history of Asia and the Indies is divided into decades; the first of which he published in 1552, the second in 1553, and the third in 1563; but the fourth decade was not published till the year 1615, when it appeared by order of King Philip III. who had the manuscript purchased of the heirs of John Barros. Several authors have continued it, so that we have at present 12 decades. He left many other works; some of which have been printed, and others remain in manuscript.

BARROW (Isaac), an eminent mathematician and divine of the last century, was the son of Mr Thomas Barrow a linen draper in London, where he was born in 1630. He was at first placed at the charter-house school for two or three years; where his behaviour afforded but little hopes of success in the profession of a scholar, he being fond of fighting, and promoting it among his school-fellows: but being removed from thence, his disposition took a happier turn; and having soon made a great progress in learning, he was admitted a pensioner of Peter House in Cambridge. He now applied himself with great diligence to the study of all parts of literature, especially to that of natural philosophy. He afterwards turned his thoughts to the profession of physic, and made a considerable progress in anatomy, botany, and chemistry; after this he studied chronology, astronomy, and geometry. He then travelled into France and Italy, and in a voyage from Leghorn to Smyrna gave a proof of his bravery; for the ship being attacked by an Algerine pirate, he staid upon deck, and with the greatest intrepidity fought, till the pirate, perceiving the stout resistance the ship made, sheered off and left her (A).

At Smyrna he met with a most kind reception from Mr

(A) There is another anecdote told of him, which not only showed his intrepidity, but an uncommon goodness of disposition, in circumstances where an ordinary share of it would have been probably extinguished. He was once in a gentleman's house in the country, where the necessary was at the end of a long garden, and consequently at a great distance from the room where he lodged: as he was going to it before day, for he

Barrow. Mr Bretton the English consul, upon whose death he afterwards wrote a Latin elegy. From thence he proceeded to Constantinople, where he received the like civilities from Sir Thomas Bendish the English ambassador, and Sir Jonathan Dawes, with whom he afterwards preserved an intimate friendship. At Constantinople he read over the works of St Chrysostom, once bishop of that see, whom he preferred to all the other fathers. When he had been in Turkey somewhat more than a year, he returned to Venice. From thence he came home in 1659, through Germany and Holland; and was episcopally ordained by bishop Brownrig. In 1660, he was chosen to the Greek professorship at Cambridge. When he entered upon this province, he intended to have read upon the tragedies of Sophocles; but he altered his intention, and made choice of Aristotle's rhetoric. These lectures having been lent to a friend who never returned them, are irrecoverably lost. July the 16th 1662, he was elected professor of geometry in Gresham-college, by the recommendation of Dr Wilkins, master of Trinity-college, and afterwards bishop of Chester. Upon the 20th of May 1663 he was elected a fellow of the Royal Society, in the first choice made by the council after their charter. The same year the executors of Mr Lucas having, according to his appointment, founded a mathematical lecture at Cambridge, they fixed upon Mr Barrow for the first professor; and tho' his two professorships were not inconsistent with each other, he chose to resign that of Gresham-college, which he did May the 20th 1664. In 1669 he resigned his mathematical chair to his learned friend Mr Isaac Newton, being now determined to give up the study of mathematics for that of divinity. Upon quitting his professorship, he was only a fellow of Trinity-college, till his uncle gave him a small sinecure in Wales, and Dr Seth Ward bishop of Salisbury conferred upon him a prebend in his church. In the year 1670 he was created doctor in divinity by mandate; and, upon the promotion of Dr Pearson master of Trinity-college to the see of Chester, he was appointed to succeed him by the king's patent bearing date the 13th of February 1672. When the king advanced him to this dignity, he was pleased to say, "he had given it to the best scholar in England." His majesty did not speak from report, but from his own knowledge: the doctor being then his chaplain, he used often to converse with him, and in his humorous way, to call him an "unfair preacher," because he exhausted every subject, and left no room for others to come after him. In 1675 he was chosen vice-chancellor of the university.—The Doctor's works are very numerous, and such as do honour to the English nation. They are, 1. Euclid's Elements. 2. Euclid's Data,

3. Optical Letters, read in the public school of Cambridge. 4. Thirteen Geometrical Letters. 5. The Works of Archimedes, the four Books of Apollonius's Conic Sections, and Theodosius's Spherics explained in a new Method. 6. A Lecture, in which Archimedes's Theorems of the Sphere and Cylinder are investigated and briefly demonstrated. 7. Mathematical Lectures, read in the public schools of the university of Cambridge: the above were all printed in Latin; and as to his English works, they are printed together in four volumes folio.—"The name of Dr Barrow (says the reverend and learned Mr Granger) will ever be illustrious for a strength of mind and a compass of knowledge that did honour to his country. He was unrivalled in mathematical learning, and especially in the sublime geometry; in which he has been excelled only by one man, and that man was his pupil the great Sir Isaac Newton. The same genius that seemed to be born only to bring hidden truths to light, to rise to the heights or descend to the depths of science, would sometimes amuse itself in the flowery paths of poetry, and he composed verses both in Greek and Latin. He at length gave himself up entirely to divinity; and particularly to the most useful part of it, that which has a tendency to make men wiser and better. He has, in his excellent sermons on the Creed, solved every difficulty and removed every obstacle that opposed itself to our faith, and made divine revelation as clear as the demonstrations in his own Euclid. In his sermons he knew not how to leave off writing till he had exhausted his subject; and his admirable discourse on the Duty and Reward of Bounty to the Poor, took him up three hours and an half in preaching. This excellent person, who was a bright example of Christian virtue, as well as a prodigy of learning, died on the 4th of May 1677, in the 47th year of his age;" and was interred in Westminster abbey, where a monument, adorned with his bust, was soon after erected, by the contribution of his friends.

BARROWS, in ancient topography, artificial hillocks or mounts, met with in many parts of the world, intended as repositories for the dead, and formed either of stones heaped up, or of earth. For the former, more generally known by the name of *cairns*, see **CAIRNS**.—Of the latter Dr Plott takes notice of two forts in Oxfordshire: one placed on the military ways; the other in the fields, meadows, or woods; the first fort doubtless of Roman erection, the other more probably erected by the Britons or Danes. We have an examination of the barrows in Cornwall by Dr Williams, in the Phil. Trans. N^o 458. from whose observations we find that they are composed of foreign or adventitious earth; that is, such as does not rise on the place, but is fetched from some distance.—Monuments of

Barrow,
Barrows.

he was a very early riser, a fierce mastiff, who used to be chained up all day, and let loose at night for the security of the house, perceiving a strange person in the garden at that unseasonable time, set upon him with great fury. The Doctor caught him by the throat, threw him, and lay upon him; and whilst he kept him down, considered what he should do in that exigence: once he had a mind to kill him; but he altered this resolution, upon recollecting that this would be unjust, since the dog did only his duty, and he himself was in fault for rambling out of his room before it was light. At length he called out so loud, that he was heard by some of the house, who came presently out, and freed the Doctor and the dog from the danger they were both in.

Barrows. of this kind are also very frequent in Scotland. On digging into the barrows, urns have been found in some of them, made of calcined earth, and containing burnt bones and ashes; in others, stone chests containing bones entire; in others, bones neither lodged in chests nor deposited in urns. These tumuli are round, not greatly elevated, and generally at their bases surrounded with a foss. They are of different sizes; in proportion, it is supposed, to the greatness, rank, and power, of the deceased person. The links or sands of Skail, in Sandwich, one of the Orkneys, abound in round barrows. Some are formed of earth alone, others of stone covered with earth. In the former was found a coffin, made of six flat stones. They are too short to receive a body at full length: the skeletons found in them lie with the knees pressed to the breast, and the legs doubled along the thighs. A bag, made of rushes, has been found at the feet of some of these skeletons, containing the bones, most probably, of another of the family. In one were to be seen multitudes of small beetles; and as similar insects have been discovered in the bag which inclosed the sacred Ibis, we may suppose that the Egyptians, and the nation to whom these tumuli did belong, might have had the same superstition respecting them. On some of the corpses interred in this island, the mode of burning was observed. The ashes, deposited in an urn which was covered on the top with a flat stone, have been found in the cell of one of the barrows. This coffin or cell was placed on the ground, then covered with a heap of stones, and that again cased with earth and fods. Both barrow and contents evince them to be of a different age from the former. These tumuli were in the nature of family vaults: in them have been found two tiers of coffins. It is probable, that on the death of any one of the family, the tumulus was opened, and the body interred near its kindred bones.

Ancient Greece and Latium concurred in the same practice with the natives of this island. Patroclus among the Greeks, and Hector among the Trojans, received but the same funeral honours with our Caledonian heroes; and the ashes of Dercennus the Laurentine monarch had the same simple protection. The urn and pall of the Trojan warrior might perhaps be more superb than those of a British leader: the rising monument of each had the common materials from our mother earth.

The snowy bones his friends and brothers place,
With tears collected, in a golden vase.
The golden vase in purple palls they roll'd
Of softest texture and inwrought with gold.
Last o'er the urn the sacred earth they spread,
And rais'd a tomb, memorial of the dead.

Pope's Homer's Iliad, xxiv. 1003.

Or, as it is more strongly expressed by the same elegant translator, in the account of the funeral of Patroclus;

High in the midst they heap the swelling bed
Of rising earth, memorial of the dead. *Ib. xxiii. 319.*

The Grecian barrows, however, do not seem to have been all equally simple. The barrow of Alyattes, father of Cræsus king of Lydia, is described by Herodotus as a most superb monument inferior only to the

works of the Egyptians and Babylonians. It was a vast mound of earth heaped on a basement of large stones by three classes of the people; one of which was composed of girls, who were prostitutes. Alyattes died, after a long reign, in the year 562 before the Christian æra. Above a century intervened, but the historian relates, that to his time five stones (*ὑποῖσθαι termini* or *stelæ*) on which letters were engraved, had remained on the top, recording what each class had performed; and from the measurement it had appeared, that the greater portion was done by the girls. Strabo likewise has mentioned it as a huge mound raised on a lofty basement by the multitude of the city. The circumference was six stadia or three quarters of a mile; the height two plethra or two hundred feet; and the width thirteen plethra. It was customary among the Greeks to place on barrows either the image of some animal or *stela*, commonly round pillars with inscriptions. The famous barrow of the Athenians in the plain of Marathon, described by Pausanias, is an instance of the latter usage. An ancient monument in Italy by the Appian-way, called without reason *the sepulchre of the Curatii*, has the same number of *termini* as remained on the barrow of Alyattes; the basement, which is square, supporting five round pyramids.—Of the barrow of Alyattes the apparent magnitude is described by travellers as now much diminished, and the bottom rendered wider and less distinct than before, by the gradual increase of the soil below. It stands in the midst of others by the lake Gygæus; where the burying-place of the Lydian princes was situated. The barrows are of various sizes, the smaller made perhaps for children of the younger branches of the royal family. Four or five are distinguished by their superior magnitude, and are visible as hills at a great distance. That of Alyattes is greatly supereminent. The lake it is likely furnished the soil. All of them are covered with green turf; and all retain their conical form without any sinking in of the top.

Barrows, or similar tumuli, are also found in great numbers in America. These are of different sizes, according to Mr Jefferson's† account; some of them constructed of earth, and some of loose stones. That they were repositories of the dead has been obvious to all; but on what particular occasion constructed, was matter of doubt. Some have thought they covered the bones of those who have fallen in battles fought on the spot of interment. Some ascribed them to the custom said to prevail among the Indians, of collecting at certain periods the bones of all their dead, wheresoever deposited at the time of death. Others again supposed them the general sepulchres for towns, conjectured to have been on or near these grounds; and this opinion was supported by the quality of the lands in which they are found (those constructed of earth being generally in the softest and most fertile meadow-grounds on river sides), and by a tradition said to be handed down from the aboriginal Indians, that when they settled in a town, the first person who died was placed erect, and earth put about him, so as to cover and support him; that when another died, a narrow passage was dug to the first, the second reclined against him, and the cover of earth replaced, and so on. "There being one of these barrows in my neighbourhood (says Mr Jefferson), I wished to satisfy myself whether any, and which of these

† *Notes on the State of Virginia, p. 156.*

Barrow.

these opinions were just. For this purpose, I determined to open and examine it thoroughly. It was situated on the low grounds of the Rivanna, about two miles above its principal fork, and opposite to some hills, on which had been an Indian town. It was of a spheroidal form, of about 40 feet diameter at the base, and had been of about 12 feet altitude, though now reduced by the plough to seven and an half, having been under cultivation about a dozen years. Before this it was covered with trees of twelve inches diameter, and round the base was an excavation of five feet depth and width, from whence the earth had been taken of which the hillock was formed. I first dug superficially in several parts of it, and came to collections of human bones, at different depths, from six inches to three feet below the surface. These were lying in the utmost confusion, some vertical, some oblique, some horizontal, and directed to every point of the compass, entangled, and held together in clusters by the earth. Bones of the most distant parts were found together; as, for instance, the small bones of the foot in the hollow of a skull, many skulls would sometimes be in contact, lying on the face, on the side, on the back, top or bottom, so as on the whole to give the idea of bones emptied promiscuously from a bag or basket, and covered over with earth, without any attention to their order. The bones of which the greatest numbers remained, were skulls, jaw-bones, teeth, the bones of the arms, thighs, legs, feet and hands. A few ribs remained, some vertebræ of the neck and spine, without their processes, and one instance only of the bone which serves as a base to the vertebral column. The skulls were so tender, that they generally fell to pieces on being touched. The other bones were stronger. There were some teeth which were judged to be smaller than those of an adult; a skull which, on a slight view, appeared to be that of an infant, but it fell to pieces on being taken out, so as to prevent satisfactory examination; a rib, and a fragment of the under-jaw of a person about half-grown; another rib of an infant; and part of the jaw of a child, which had not yet cut its teeth. This last furnishing the most decisive proof of the burial of children here, I was particular in my attention to it. It was part of the right half of the under jaw. The processes by which it was articulated to the temporal bones were entire; and the bone itself firm to where it had been broken off, which, as nearly as I could judge, was about the place of the eye-tooth. Its upper edge, wherein would have been the sockets of the teeth, was perfectly smooth. Measuring it with that of an adult, by placing their hinder processes together, its broken end extended to the penultimate grinder of the adult. This bone was white, all the others of a sand colour. The bones of infants being soft, they probably decay sooner, which might be the cause so few were found here. I proceeded then to make a perpendicular cut through the body of the barrow, that I might examine its internal structure. This passed about three feet from its centre, was opened to the former surface of the earth, and was wide enough for a man to walk through and examine its sides. At the bottom, that is, on the level of the circumjacent plain, I found bones; above these a few stones, brought from a cliff a quarter of a mile off, and from the river one-eighth of a mile off; then a large

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interval of earth, then a stratum of bones, and so on. At one end of the section were four strata of bones plainly distinguishable; at the other three; the strata in one part not ranging with those in another. The bones nearest the surface were least decayed. No holes were discovered in any of them, as if made with bullets, arrows, or other weapons. I conjectured that in this barrow might have been a thousand skeletons. Every one will readily seize the circumstances above related, which militate against the opinion that it covered the bones only of persons fallen in battle; and against the tradition also which would make it the common sepulchre of a town, in which the bodies were placed upright, and touching each other. Appearances certainly indicate that it has derived both origin and growth from the accustomary collection of bones, and deposition of them together; that the first collection had been deposited on the common surface of the earth, a few stones put over it, and then a covering of earth; that the second had been laid on this, had covered more or less of it in proportion to the number of bones, and was then also covered with earth, and so on. The following are the particular circumstances which give it this aspect. 1. The number of bones. 2. Their confused position. 3. Their being in different strata. 4. The strata in one part having no correspondence with those in another. 5. The different states of decay in these strata, which seem to indicate a difference in the time of inhumation. 6. The existence of infant bones among them. But on whatever occasion they may have been made, they are of considerable notoriety among the Indians: for a party passing, about thirty years ago, through the part of the country where this barrow is, went through the woods directly to it, without any instructions or inquiry; and having staid about it some time, with expressions which were construed to be those of sorrow, they returned to the high road, which they had left about half a dozen of miles to pay this visit, and pursued their journey. There is another barrow, much resembling this in the low grounds of the South branch of Shenandoah, where it is crossed by the road leading from the Rock-fish gap to Staunton. Both of those have, within these dozen years, been cleared of their trees and put under cultivation, are much reduced in their height, and spread in width, by the plough, and will probably disappear in time. There is another on a hill in the blue ridge of mountains, a few miles north of Wood's gap, which is made up of small stones thrown together. This has been opened and found to contain human bones as the others do. There are also many others in other parts of the country."

BARROW, in the salt works, are wicker cases, almost in the shape of a sugar-loaf, wherein the salt is put to drain.

BARRULET, in heraldry, the fourth part of the bar, or the one half of the clofset; an usual bearing in coat-armour.

BARRULY, in heraldry, is when the field is divided bar-ways, that is, across from side to side, into several parts.

BARRY (Girald), commonly called *Giraldus Cambrensis*, i. e. *Girald of Wales*, an historian and ecclesiastic in the reigns of Henry II. and Richard I. was born at the castle of Mainarper, near Pembroke, A. D.

F

1146.

Barrow

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Barry.

Barry.

1146. By his mother he was descended from the princes of South Wales; and his father, William Barry, was one of the chief men of that principality. Being a younger brother, and intended for the church, he was sent to St David's, and educated in the family of his uncle, who was bishop of that see. He acknowledges, in his history of his own life and actions, that in his early youth he was too playful; but being severely reproached for it by his preceptors, he became a very hard student, and greatly excelled all his school-fellows in learning. When he was about 20 years of age, he was sent, A. D. 1166, for his further improvement, to the university of Paris; where he continued three years, and became, according to his own account, a most excellent rhetorician; which rendered him very famous. On his return into Britain, he entered into holy orders, and obtained several benefices both in England and Wales. Observing, with much concern, that his countrymen, the Welch, were very backward in paying the tithes of wool and cheese, which he was afraid would involve them in eternal damnation, he applied to Richard archbishop of Canterbury, and was appointed his legate in Wales for rectifying that disorder, and for other purposes. He executed this commission with great spirit; excommunicating all, without distinction, who refused to save their souls by surrendering the tithes of their cheese and wool. Not satisfied with enriching, he also attempted to reform, the clergy; and dilated the archdeacon of Brechin to the archbishop, for the unpardonable crime of matrimony; and the poor old man, refusing to put away his wife, was deprived of his archdeaconry; which was bestowed upon our zealous legate. In discharging the duties of this new office, he acted with great vigour, which involved him in many quarrels; but, if we may believe himself, he was always in the right, and always victorious. His uncle, the bishop of St David's, dying A. D. 1176, he was elected his successor by the chapter: but this election having been made without the permission, and contrary to the inclination of Henry II. our author prudently declined to insist upon it, and went again to Paris to prosecute his studies, particularly in the civil and canon law, and theology. He speaks with great raptures of the prodigious fame he acquired by his eloquent declamations in the schools, and of the crowded audiences who attended them, who were at a loss to know whether the sweetness of his voice, the beauty of his language, or the irresistible force of his arguments, were most to be admired. Having spent about four years at Paris, he returned to St David's; where he found every thing in confusion; and the bishop being expelled by the people, he was appointed administrator by the archbishop of Canterbury, and governed the diocese in that capacity to A. D. 1184, when the bishop was restored. About the same time he was called to court by Henry II. appointed one of his chaplains, and sent into Ireland, A. D. 1185, with prince John. By this prince he was offered the united bishoprics of Fernes and Leighlin; but declined them, and employed his time in collecting materials for his Topography of Ireland, and his history of the conquest of that island. Having finished his Topography, which consisted of three books, he published it at Oxford, A. D. 1187, in the following manner, in three days. On the first day he read the first book to a great concourse of peo-

ple, and afterwards entertained all the poor of the town; on the second day he read the second book, and entertained all the doctors and chief scholars; and, on the third day, he read the third book, and entertained the younger scholars, soldiers, and burgeses. "A most glorious spectacle! (says he) which revived the ancient times of the poets, and of which no example had been seen in England." He attended Baldwin archbishop of Canterbury, in his progress through Wales, A. D. 1186, in preaching a crusade for the recovery of the Holy Land; in which, he tells us, he was far more successful than the primate; and particularly, that the people were prodigiously affected with his Latin sermons, which they did not understand, melting into tears, and coming in crowds to take the cross. Although Henry II. as our author assures us, entertained the highest opinion of his virtues and abilities; yet he never would advance him to any higher dignity in the church, on account of his relation to the princes and great men of Wales. But on the accession of Richard I. (A. D. 1189.), his prospects of preferment became better: for he was sent for by that prince into Wales to preserve the peace of that country, and was even joined in commission with William Longchamp, bishop of Ely, as one of the regents of the kingdom. He did not, however, improve this favourable opportunity; refusing the bishopric of Bangor in A. D. 1190, and that of Landaff the year after, having fixed his heart on the see of St David's, the bishop of which was very old and infirm. In A. D. 1192, the state of public affairs, and the course of interest at court, became so unfavourable to our author's views, that he determined to retire. At first he resolved to return to Paris to prosecute his studies; but meeting with some difficulties in this, he went to Lincoln, where William de Monte read lectures in theology with great applause. Here he spent about six years in the study of divinity, and in composing several works. The see of St David's, which had long been the great object of his ambition, became vacant, A. D. 1198, and brought him again upon the stage. He was unanimously elected by the chapter; but met with so powerful an adversary in Hubert archbishop of Canterbury (who opposed his promotion with great violence), that it involved him in a litigation which lasted five years, cost him three journeys to Rome, at a great expence, and in which he was at last defeated, A. D. 1203. Soon after this he retired from the world, and spent the last 17 years of his life in a studious privacy, composing many books, of which we have a very correct catalogue in the Biographia Britannica. That Girald of Wales was a man of uncommon activity, genius, and learning, is undeniable; but these and his other good qualities were much tarnished by his insufferable vanity, which must have been very offensive to his contemporaries, as it is highly disgusting to his readers.

BARRY, in heraldry, is when an escutcheon is divided bar-ways, that is, across from side to side, into an even number of partitions, consisting of two or more tinctures, interchangeably disposed: it is to be expressed in the blazon by the word *barry*, and the number of pieces must be specified; but if the divisions be odd, the field must be first named, and the number of bars expressed.

BARRY-Bendy, is when an escutcheon is divided evenly, bar and bend-ways, by lines drawn transverse and diagonal,

Barry.

Barfa
||
Barfanti.

diagonal, interchangeably varying the tinctures of which it consists.

BARRY-Pily is when a coat is divided by several lines drawn obliquely from side to side, where they form acute angles.

BARSA (anc. geog.), an island on the coast of France, in the English Channel, Itinerary: *Basepool* according to some; but according to others, *Bardsey*.

BARSALLI, a kingdom of Africa, bordering on the river Gambia, inhabited by a tribe of negroes called *Jaloffs*. The government of this kingdom is a most despotic monarchy: all people being obliged to prostrate themselves on the earth when any of the royal family makes his appearance. In time of war, every soldier has his share of the booty, and the king but a certain proportion, which is moderate, considering that if he pleased he might keep the whole. The kingdom is divided into a number of provinces, over which governors called *bumeys* are appointed by the king. These *bumeys* are absolute within their jurisdictions; but they seldom carry their prerogative so far as to incur the dislike of the people, which would quickly prove fatal to them. The Mahometan religion is professed by the king and his court; though little regard is paid to that part of the impostor's creed which forbids the use of wine; for the king cannot live without brandy, nor is he ever more devout than when he is drunk. When his majesty is in want of brandy or other necessaries, he sends to beg of the governor of James-fort that he will dispatch a boat with the merchandize he has occasion for; and to purchase this he plunders the neighbouring towns, and seizes a certain number of his subjects, whom he sells for slaves to the Europeans in exchange for their commodities. This is his method of supplying himself if he happens to be at peace with his neighbours; for which reason the people are never so happy as when at war; and hence they pursue war with great vigour, and continue it with obstinacy.—The general dress of the people is a kind of loose callicoe surplice, that hangs down below the knee; which they sometimes plait about the waist in a very agreeable manner. They wear a great number of gold trinkets in their hair, ears, noses, and round their necks, arms, and legs; but the women especially are fond of these ornaments. The king of Barfalli, whom Moore saw in 1732, had a prodigious number of women: but when he went abroad he was seldom attended by more than two, who seemed to be dressed out in the whole finery and jewels of the seraglio. He had likewise a number of brethren; but it was seldom that he deigned to speak to them: if ever he did them that honour, they were forced to treat him with the same respect as other subjects, and fall prostrate on the earth the moment they came into his presence, notwithstanding they were the presumptive heirs of the crown. It is indeed usual for the king's children to dispute the right of succession with his brethren, and the longest sword generally carries away the prize.

BARSANTI (Francisco), an eminent musical performer and composer, was born at Lucca about the year 1690. He studied the civil law in the university of Padua; but, after a short stay there, chose music for his profession. Accordingly he put himself under the tuition of some of the ablest masters in Italy; and having attained to a considerable degree of proficiency in the science of practical composition, took a resolu-

tion to settle in England, and came thither with *Geminiani*, who was also a Lucchese, in the year 1714. He was a good performer on the hautboy, and also on the flute; in the former capacity he found employment in the opera band, and in the latter derived considerable advantages by teaching. He published with a dedication to the earl of Burlington, six solos for a flute with a thorough-bass, and afterwards six solos for a German flute and a bass. He also made into sonatas, for two violins and a bass, the first six solos of *Geminiani*. He continued many years a performer at the opera-house; at length, reflecting that there was a prospect of advantage for one of his profession in Scotland, he went thither; and, with greater truth than the same is asserted of *David Rizzo*, may be said to have meliorated the music of this country, by collecting and making basses to a great number of the most popular Scots tunes. About the year 1750 *Barfanti* returned to England; but, being advanced in years, he was glad to be taken into the opera band as a performer on the tenor violin; and in the summer season into that of *Vauxhall*. At this time he published 12 concertos for violins; and shortly after, *Sei Antifone*, in which he endeavoured to imitate the style of *Palestrina*, and the old composers of motets: but from these publications so little profit resulted, that, towards the end of his life, the industry and economy of an excellent wife, whom he had married in Scotland, and the studies and labours of a daughter, whom he had qualified for the profession of a singer, but who is now an actress at *Covent-Garden*, were his chief support.

BARTAS (William de Saluste du), a French poet, who lived in the 16th century. He was employed by *Henry IV.* of France, in England, Denmark, and Scotland; and commanded a troop of horse in Gascony, under the *marechal de Martignan*. He was a Calvinist; and died in 1590, aged 46. He wrote a great number of poems; the most famous of which are, 1. *The Week*, or the Creation of the World, in seven books. 2. *The Poem of Judith*; and 3. *The Battle of Ivry*, gained by *Henry IV.* in 1590. *Du Bartas* wrote in a bombast style.

BARTAR, or *TRUCK*, is the exchanging of one commodity for another. The word comes from the Spanish *barator*, to deceive or circumvent in bargaining, perhaps because those who deal this way usually endeavour to over-reach one another.

To transact properly, the price of one of the commodities, and an equivalent quantity of the other, must be found either by practice or by the rule of three.

Quest. 1. How many pounds of cotton, at 9 d. per lb. must be given in bartar for 13 C. 3 Q. 14 lb. of pepper, at 2 l. 16 s. per C.?

First. Find the price or value of the commodity whose quantity is given as follows:

	C.	Q.	lb.	L.	s.
	13	3	14	at	2 16
	26				
2 l.	10	8			
16 s.	1	8			
2 Q.		14			
1 Q.		7			
14 lb.					
	L. 38	17			

F 2

Secondly,

Bartas,
Bartar.

Bartar
||
Barthius.

Secondly, Find how much cotton, at 9 d. per lb. 38 l. 17 s. will purchase as under :

$$\begin{array}{r} d. \text{ lb. } L. s. \\ \text{If } 9 : 1 :: 38 \text{ } 17 \\ \quad \quad \quad 20 \\ \hline \quad \quad \quad 777 \\ \quad \quad \quad 12 \\ \hline \quad 9)9324(\\ \hline \text{Ans. } 1036 \text{ lb.} = 9 \text{ } 1 \end{array} \quad C. 2.$$

If the above question be wrought decimally, the operation may stand as follows :

$$\begin{array}{r} C. \quad L. \quad C. \\ \text{If } 1 : 2.8 :: 13.875 \\ \quad \quad \quad 2.8 \\ \hline \quad \quad \quad 111000 \\ \quad \quad \quad 27750 \\ \hline \quad \quad \quad \text{lb. } C. 2. \\ .0375)38.8500(1036 = 9 \text{ } 1 \text{ Ans.} \\ \quad \quad \quad 375 \dots \\ \hline \quad \quad \quad 1350 \\ \quad \quad \quad 1125 \\ \hline \quad \quad \quad 2250 \\ \quad \quad \quad 2250 \\ \hline \end{array}$$

The value or price of the goods received and delivered in bartar being always equal, it is obvious that the product of the quantities received and delivered, multiplied in their respective rates, will be equal.

Hence arises a rule which may be used with advantage in working several questions; namely, Multiply the given quantity and rate of the one commodity, and the product divided by the rate of the other commodity quotes the quantity sought : or divided by the quantity quotes the rate.

Quest. 2. How many yards of linen, at 4 s. per yard, should I have in bartar for 120 yards of velvet, at 15 s. 6 d. ?

$$\begin{array}{r} Yds. \quad Sixp. \quad Sixp. \quad Yds. \\ 120 \times 31 = 3720, \text{ and } 8)3720(459 \text{ Ans.} \end{array}$$

BARTH, or BART (John), a brave fisherman of Dunkirk, who rose to the rank of an admiral; and is celebrated for his signal valour and naval exploits, in the annals of France. He died in 1702, aged 51.

BARTHIUS (Gaspar), a very learned and copious writer, born at Custrin in Brandenburg, the 22d of June 1576. Mr Baillet has inserted him in his *Enfans Celebres*; where he tells us, that at 12 years of age he translated David's Psalms into Latin verse of every measure, and published several Latin Poems. Upon the death of his father (who was professor of civil law at Francfort, counsellor to the elector of Brandenburg, and his chancellor at Custrin), he was sent to Gotha, then to Eisenach, and afterwards, according to custom, went through all the different universities in Germany. When he had finished his studies, he began his travels; he visited Italy, France, Spain, England, and Holland, improving himself by the conversation and works of the learned in every country. He studied the modern

as well as ancient languages, and his translations from the Spanish and French show that he was not content with a superficial knowledge. Upon his return to Germany, he took up his residence at Leipzig, where he led a retired life, his passion for study having made him renounce all sort of employment. He wrote a vast number of books; the principal of which are, 1. His *Adversaria*, a large volume in folio; the second and third volumes of which he left in manuscript. 2. A Translation of *Aeneas Gazæus*. 3. A large volume of Notes upon Claudian, in 4to. 4. Three large volumes upon Statius, &c. He died at Leipzig, in 1658, aged 71.

BARTHOLINUS (Caspar), a learned physician and anatomist in the 17th century, was born at Malmoe, a town in the province of Schonen, which then belonged to Denmark. At three years of age he had such a quick capacity, that in 14 days he learned to read; and in his 13th year he composed Greek and Latin orations, and pronounced them in public. When he was about 18 he went to the university of Copenhagen, and afterwards studied at Rostock and Wirtemberg. He next set out upon his travels; during which he neglected no opportunity of improving himself at the different universities to which he came, and every where receiving marks of respect. He was in 1613 chosen professor of physic in that university, which he enjoyed 11 years; when, falling into a dangerous illness, he made a vow, that if it should please God to restore him, he would solely apply himself to the study of divinity. He recovered, and kept his word; and soon after obtained the professorship of divinity, and the canony of Roschild. He died on the 13th of July 1629, after having written several small works chiefly on metaphysics, logic, and rhetoric.

BARTHOLINUS (Thomas), a celebrated physician, son of the former, was born at Copenhagen in 1616. After studying some years in his own country, he in 1637 went to Leyden, where he studied physic during three years. He then travelled into France; and resided two years at Paris and Montpellier, in order to improve himself under the famous physicians of those universities. Afterwards going to Italy, he continued three years at Padua; and at length went to Basil, where he obtained the degree of doctor of philosophy. Soon after, he returned to Copenhagen; where in 1647 he was appointed professor of the mathematics; and next year was nominated to the anatomical chair, an employment better suited to his genius and inclination; which he discharged with great assiduity for 13 years, and distinguished himself by making several discoveries with respect to the lacteal veins and lymphatic vessels. His close application, however, having rendered his constitution very infirm, he, in 1661, resigned his chair; but the king of Denmark allowed him the title of *honorary professor*. He now retired to a little estate he had purchased at Hagested, near Copenhagen, where he hoped to have spent the remainder of his days in peace and tranquillity; but his house being burnt in 1650, his library, with all his books and manuscripts, was destroyed. In consideration of this loss the king appointed him his physician with a handsome salary, and exempted his land from all taxes; the university of Copenhagen also appointed him their librarian; and, in 1675, the king did him

Bartholi-
nus.

St Bartho-
lomew's
day
||
Bartolo-
meo.

the honour to give him a seat in the grand council of Denmark. He wrote, 1. *Anatomia Caspari Bartholini Parentis novis Observationibus primum locupletata*, 8vo. 2. *De Monstris in Natura et Medecina*, 4to. 3. *De Armillis Veterum, præsertim Danorum Schedion*, 8vo.; and several other works. This great man died on the 4th of December 1680.

St BARTHOLOMEW'S DAY, a festival of the Christian church, celebrated on the 24th of August. St Bartholomew was one of the twelve apostles; and is esteemed to be the same as Nathaniel, one of the first disciples that came to Christ.

It is thought this apostle travelled as far as India, to propagate the gospel; for Eusebius relates, that a famous philosopher and Christian, named *Pantenus*, desiring to imitate the apostolical zeal in propagating the faith, and travelling for that purpose as far as India, found there, among those who yet retained the knowledge of Christ, the gospel of St Matthew, written, as the tradition asserts, by St Bartholomew, one of the twelve apostles, when he preached the gospel in that country. From thence he returned to the more northern and western parts of Asia, and preached to the people of Hierapolis; then in Lycaonia; and lastly at Albania, a city upon the Caspian Sea; where his endeavours to reclaim the people from idolatry were crowned with martyrdom, he being (according to some writers) flea'd alive, and crucified with his head downwards.—There is mention made of a Gospel of St Bartholomew, in the preface to Origen's Homilies on St Luke, and in the preface to St Jerome's commentary on St Matthew: but it is generally looked upon as spurious, and is placed by Pope Gelasius among the apocryphal books.

BARTHOLOMEW (St), one of the Caribbee islands belonging to the French, who sent a colony thither in 1648. It is about 24 miles in compass, and has a good haven. W. Long. 62. 15. N. Lat. 18. 6.

BARTHOLOMITES, a religious order founded at Genoa in the year 1307; but the monks leading very irregular lives, the order was suppressed by Pope Innocent X. in 1650, and their effects were confiscated. In the church of the monastery of this order at Genoa is preserved the image which it is pretended Christ sent to king Abgarus. See ABGARUS.

BARTOLOCCI (Julius), a learned monk, and professor of Hebrew at Rome, was born at Celeno, in 1613; and distinguished himself by writing an excellent Hebrew and Latin catalogue of the Hebrew writers and writings, in 4 vols folio, a continuation of which was performed by Imbonati his disciple. He died in 1687.

BARTOLOMEO (Francisco), a celebrated painter, born at Savignano, a village 10 miles from Florence, in the year 1469, was the disciple of Cosimo Rosselli, but was much more beholden to the works of Leonarda da Vinci for his extraordinary skill in painting. He was well versed in the fundamentals of design. Raphael, after quitting the school of Perugino, applied to this master; and under him studied the rules of perspective, with the art of managing and uniting his colours. In the year 1500, he turned Dominican friar; and some time after was sent by his superiors to the convent of St Martin, in Florence. He painted both portraits and histories; but his scrupulous con-

science would hardly ever suffer him to draw naked figures, though nobody understood them better. He died in 1517, aged 48.

BARTON, a town of Lincolnshire, seated on the river Humber, where there is a considerable ferry to pass over into Yorkshire. W. Long. 0. 10. N. Lat. 53. 40.

BARTSIA, PAINTED CUP: A genus of the angiospermia order, belonging to the didynamia class of plants; and in the natural method ranking under the 40th order, *Personate*. The calyx is bilbous, emarginated and coloured; the corolla less coloured than the calyx, with its upper lip longer than the under one. The viscosa or marshy, called also *yellow marsh eyebright*, was found by Mr Lightfoot in bogs and marshy places about Loch Goyl, near Loch Long, in the district of Cowal in Argyleshire. The plant is about 10 or 12 inches high, with an erect stalk downy and unbranched: the leaves are sessile, spear-shaped, and a little viscosus; the flowers are yellow, and the plant dries black. It is likewise found in marshy places in Cornwall in England. The alpina, or mountain eyebright cow-wheat, hath heart-shaped leaves placed opposite, and bluntly serrated, with purple blossoms in leafy spikes. It is likewise a native of Britain, and is found near rivulets in hilly countries. Sheep and goats eat it. There are two other species.

BARUCH (the prophecy of), one of the apocryphal books, subjoined to the canon of the Old Testament. Baruch was the son of Neriah, who was the disciple and amanuensis of the prophet Jeremiah. It has been reckoned part of Jeremiah's prophecy, and is often cited by the ancient fathers as such. Josephus tells us, Baruch was descended of a noble family; and it is said in the book itself, that he wrote this prophecy at Babylon; but at what time is uncertain. It is difficult to determine in what language this prophecy was originally written. There are extant three copies of it; one in Greek, the other two in Syraic; but which of these, or whether any one of them, be the original, is uncertain.

BARULES, in church-history, certain heretics, who held, that the Son of God had only a phantom of a body; that souls were created before the world, and that they lived all at one time.

BARUTH, an ancient town of Turkey in Syria, with a Christian church of the Nestorian persuasion. It is situated in a fine fertile soil, but is inconsiderable now to what it was formerly. E. Long. 34. 20. N. Lat. 33. 30.

BARUTH, an Indian measure, containing 17 gantans: It ought to weigh about three pounds and an half English avoirdupois.

BARYTONUM, in the Greek grammar, denotes a verb, which having no accent marked on the last syllable, a grave accent is to be understood. In Italian music, *barytono* answers to our common pitch of bas.

BAS CHEVALIER. See BACHELOR.

Bas-Relief. See Basso-Relievo.

BAS (James Philip le), a modern French engraver, by whom we have some excellent prints. His great force seems to lie in landscapes and small figures, which he executed in a superior manner. His style of engraving is extremely neat; but yet he proves the freedom of the etching, and harmonizes the whole with the

Barton
||
Bas.

Basaltes.

the graver and dry point. We have also a variety of pretty vignettes by this artist. He flourished about the middle of the present century; but we have no account of the time of his birth or death.

¹
Name, derivation, &c.

BASALTES (from *basal*, "iron," or *basaltis* *diligenter examin*o), in natural history, an heavy, hard stone, chiefly black or green, consisting of prismatic crystals, the number of whose sides is uncertain. The English miners call it *cockle*; the German *schoerl*. Its specific gravity is to that of water as 3000 or upwards to 1000. It frequently contains iron; and consists either of particles of an indeterminate figure, or of a sparry, striated, or fibrous texture. It has a flinty hardness, is insoluble by acids, and is fusible by fire. The following is an analysis of some basaltes by Mr Bergman; and as the resemblance of it to lava will be frequently mentioned in the succeeding part of this article, we shall here contrast this analysis with that of lava by the same author.

²
Comparative analysis of basaltes and lava.

Basaltes, 100 parts contains	Lava, 100 parts contains
Siliceous earth 50	Siliceous earth 49
Argillaceous 15	Argillaceous 35
Calcareous 8	Calcareous 4
Magnesia 2	Iron 12
Iron 25	

The most remarkable property of this substance is its figure, being never found in strata, like other marbles, but always standing up in the form of regular angular columns, composed of a number of joints, one placed upon, and nicely fitted to another, as if formed by the hands of a skilful workman. See Plate XCII. fig. 15.

³
Basaltes, where found.

Basaltes was originally found in columns in Ethiopia, and fragments of it in the river Tmolus, and some other places. We now have it frequently, both in columns and small pieces, in Spain, Russia, Poland, near Dresden, and in Silesia; but the noblest store in the world seems to be that called the Giant's Causeway in Ireland, and Staffa, one of the western isles of Scotland*. Great quantities of basaltes are likewise found in the neighbourhood of Mount Ætna in Sicily, of Hecla in Iceland, and of the volcano in the island of Bourbon. These are the only three active volcanoes in whose neighbourhood it is to be met with; but it is also found in the extinguished volcanoes in Italy, though not in the neighbourhood of Vesuvius.

* See Giant's Causeway and Staffa.

⁴
Of the Giant's Causeway in Ireland.

In Ireland the basaltes rises far up the country, runs into the sea, crosses at the bottom, and rises again on the opposite land. In Staffa the whole end of the island is supported by natural ranges of pillars, mostly above 50 feet high, standing in natural colonnades, according as the bays and points of land have formed themselves, upon a firm basis of solid unformed rock. Above these, the stratum, which reaches to the soil or surface of the island, varies in thickness, as the island itself is formed into hills or valleys, each hill, which hangs over the valleys below, forming an ample pediment. Some of these, above 60 feet in thickness from the base to the point, are formed by the sloping of the hill on each side, almost into the shape of those used in architecture.

The pillars of the Giant's Causeway have been very particularly described and examined. The most accurate account of them is to be met with in a work

intituled, "Letters concerning the northern coast of the country of Antrim;" from which the following particulars relative to the present subject are extracted.

Basaltes.

"1. The pillars of the Causeway are small, not very much exceeding 1 foot in breadth and 30 in length; sharply defined, neat in their articulation, with concave or convex terminations to each point. In many of the capes and hills they are of a larger size; more imperfect and irregular in their figure and articulation, having often flat terminations to their joints. At Fairhead they are of a gigantic magnitude, sometimes exceeding 5 feet in breadth and 100 in length; oftentimes apparently destitute of joints altogether. Through many parts of the country, this species of stone is entirely rude and unformed, separating in loose blocks; in which state it resembles the stone known in Sweden by the name of *trappe*.

⁵
Particular account of the pillars.

Pl. XCIII. fig. 1.

"2. The pillars of the Giant's Causeway stand on the level of the beach; from whence they may be traced through all degrees of elevation to the summit of the highest grounds in the neighbourhood.

"3. At the Causeway, and in most other places, they stand perpendicular to the horizon. In some of the capes, and particularly near Ushet harbour, in the isle of Bagherly, they lie in an oblique position. At Doon point in the same island, and along the Balintoy shore, they form variety of regular curves.

"4. The stone is black, close, and uniform; the varieties of colour are blue, reddish, and grey; and of all kinds of grain, from extreme fineness to the coarse granulated appearance of a stone which resembles imperfect granite, abounding in crystals of schorl chiefly black, though sometimes of various colours.

"5. Though the stone of the Giant's Causeway be in general compact and homogeneous; yet it is remarkable, that the upper joint of each pillar, where it can be ascertained with any certainty, is always rudely formed and cellular. The gross pillars also in the capes and mountains frequently abound in these air-holes through all their parts, which sometimes contain fine clay, and other apparently foreign bodies: and the irregular basaltes beginning where the pillars cease, or lying over them, is in general extremely honey-combed; containing in its cells crystals of zeolite, little morsels of fine brown clay, sometimes very pure steatite, and in a few instances bits of agate."

Sir Joseph Banks observes, that the bending pillars of Staffa differ considerably from those of the Giant's Causeway. In Staffa they lie down on their sides, each forming the segment of a circle; and in one place, a small mass of them very much resembles the ribs of a ship. Those of the Giant's Causeway which he saw, ran along the face of a high cliff, bent strangely in the middle, as if unable, at their first formation, while in a soft state, to support the mass of incumbent earth.

⁶
Account of those in Staffa.

The rocks of the Cyclops, in the neighbourhood of Ætna, exhibit very magnificent basaltic pillars. A general view of them is given on Plate XCIII. fig. 2. where *a, b, c*, are the three principal rocks; *e* is the extremity of an island, one half of which is composed of lava, on a base of basaltes, of no uncommon nature; above which there is a crust of pozzolana, combined with a certain white calcareous matter, which is pretty hard and compact; and which, as it is composed by the action

⁷
Rocks of the Cyclops described.

Basalt. tion of the air, appears like a piece of knotty, porous, wood. That rock, at some former period, became so hard as to split; and the clefts were then filled up with a very hard and porous matter like scoriæ. This matter afterwards acquiring new hardness also split, leaving large interstices, which in their turn have been filled up with a species of compound yellow matter. The island was formerly inhabited; and there still remains a flight of steps leading from the shore to the ruins of some houses which appear to have been hewn in the rock.

The rock *b* has the straightest and most regular columns of any. It is represented distinctly in Plate XCIV. fig. 1. and likewise a general view of *c* and *d*, with the foot of *Ætna* leading to Catanea. These basaltic columns, at first view, seem to resemble those of the Giant's Causeway, and others commonly met with: but on a nearer inspection, we find remarkable difference; being assembled in groups of five or six about one, which serves as their common centre. They are of various sizes and forms; some square, others hexagonal, heptagonal, or octagonal. One half of this rock is composed of perpendicular columns; the other of another species of basaltis disposed in inclined, and almost rectilinear, layers. These are in contact with the columns, and are as closely connected with them as they are with one another. The layers are longer at the base than towards the top of the rock. It is further to be remarked, that most of these layers are subdivided as they rise upwards; so that towards these upper extremities, one layer presents to the eye sometimes one, sometimes two, and sometimes three, divisions. The fragments of basaltis taken off from these layers are of a rhomboidal figure, because the layers break obliquely.

These layers, though inclined towards the base, become almost perpendicular towards the upper part of the rock, where they appear united in a point, and overtop most of the visible and elevated parts of the prismatic columns. These columns terminate in such a manner as to form a kind of stair-case. They appear even to rise under a species of clay with which they are covered at one extremity, till they reunite themselves with the point which is formed by the most elevated parts of the layers of basaltis beside them.

This extraneous matter with which these columns are covered, and of which the summit of this pyramid consists, appears to be of the same species with the former, composing the upper part of the island already described.

The basaltis of that island has one particularity, viz. that it is full of small crystals of about the size of peas. These appear no less beautiful than rock-crystal; but they are much softer, and yield even to the action of the air. We see here large fragments of basaltis which were formerly full of crystals, but destroyed by time. They are now not unlike a sponge, from the great number of holes which appear all over their surface. Those pieces of basaltis which contain most of these crystals are not so hard as those which contain fewer of them.

⁸
Basaltis on
the pro-
montory of
the Castel
d'Iaci de-
scribed.

The promontory of Castel d'Iaci, which terminates the basis of *Ætna*, is almost entirely composed of basaltis, but of a kind very different from the former. It consists of a great number of cylinders from the dia-

meter of six inches to that of twenty feet. Some of these are solid, others hollow like cannon; some extended in layers, others similar to carrots of tobacco consisting of a number of pieces squeezed together. Some of these cylinders are straight, others curved into a variety of forms. Some look like globes inclosed in the rocks; and in the fractures of these globes we perceive the strata of which they are composed.

Fig. 2. represents the basaltis at the foot of this promontory on the south side. The little mounts into which it appears to be collected, are sometimes only one French foot in diameter, sometimes six. They are composed of small prisms or needles, or of cubic trapezoids, and consist of a matter distinguished by the name of *dirty lava*. It is made up of pozzolana, consolidated by a certain liquid, which while it has communicated solidity to the pozzolana, has at the same time suffered that substance to shrink considerably, in such a manner as to leave large chinks between the pieces of basaltis, which are thus formed by the operation of the liquid on the pozzolana. It appears also to have insinuated itself into the clay with which the promontory is covered; which has become hard in its turn, and which has also split into chinks that appear to contain a kind of hard matter.

These descriptions and figures will serve to give an idea of the appearance of the basaltis, which is now generally accounted a kind of marble. Wallerius considers it as a species of the corneous or horn-rock; and Cronstedt enumerates it among those substances which he calls *garnet earths*. The largest block of this stone that ever was seen, was placed, according to Pliny, by Vespasian in the temple of Peace. It represented the figure of Nilus, with 16 children playing about it, denoting as many cubits of the rise of the river. The statue of Memnon in the temple of Serapis at Thebes, which sounded at the rising of the sun, was also made of the same material, if we may believe this author. Most of the Egyptian figures are likewise made of basaltis. Some of the ancients call it *Lapis Lydius*, from Lydia, where it seems it was formerly found in greatest abundance. The moderns denominate it the *touch-stone*, as being used for the trial of gold and silver.

⁹
Basaltis
used in dif-
ferent an-
cient works.

Various substances are found intermixed with basaltis; of which Mr Hamilton, in the letters above-mentioned, enumerates the following. 1. Extensive layers of red ochre, varying in all degrees from a dull ferruginous colour to a bright red, answering very well for coarse painting. 2. Veins of iron ore, sometimes very rich, commonly of a very brown or reddish cast, at other times of a blue colour. 3. Steatites, generally of a greenish soapy appearance, more rarely of a pure white, and raising an imperfect saponaceous froth when agitated with water. 4. Zeolite, of a bright and pure white colour; in masses, varying in weight from a grain to a pound; generally disposed in cavities of the cellular basaltis; often affecting a crystallization, in which the fibres proceed as rays from a centre; and in some instances have a beautiful spangled appearance, resembling that of thistle-down. The most remarkable property of this substance is, that with any of the mineral acids, but especially with that of nitre, it forms a gelatinous mixture in the course of a few hours. 5. Peperino stone, a friable matrix of indurated clay and

¹⁰
Substances
mixed with
basaltis.

Bafaltes.

and iron, fludded with little bits of zeolite or other substances; and which is often of a reddish burnt colour. 6. Pumice-stone of a black colour, containing iron not entirely dephlogisticated, but still acting on the magnetical needle.

11
Of the nature of bafaltes.

These substances are met with among the bafaltes of the Giant's Causeway in Ireland. In other places its attendants may perhaps vary according to circumstances. The bafaltes itself has been considered by some as a crystallization from water; but others strenuously maintain that it is only a species of lava, and in defence of these opinions very considerable disputes have been carried on. The following is a state of the arguments on both sides from Mr Hamilton's treatise already mentioned.

12
Mr Hamilton's state of the arguments concerning it.

In support of the volcanic origin of the bafaltes it has been argued,

1. That it agrees almost entirely with lava in its elementary principles, in its grain, the species of the foreign bodies it includes, and all the diversities of its texture.

2. The iron of the bafaltes is found to be in a metallic state, capable of acting on the magnetical needle, which is also the case with that found in compact lava.

3. The bafaltes is fusible *per se*; a property which it has in common with lavas.

4. The bafaltes is a foreign substance superinduced on the original limestone-soil of the country, in a state of softness capable of allowing the flints to penetrate considerably within its lower surface.

5. Those extensive beds of red ochre which abound among our bafaltes are supposed to be an iron earth reduced to this state by the powerful action of heat; for such a change may be produced on iron in our common furnaces, provided there be a sufficient afflux of fresh air; and the bafaltes itself, on such circumstances, is easily reducible to an impure ochre. This is also found to take place in the living volcanoes, particularly within their craters; and is therefore supposed to afford a presumptive argument of the action of fire in the neighbourhood of bafaltes.

6. Though zeolite is not yet proved to be the actual production of a volcano, yet its presence is always supposed to give countenance to this hypothesis; because zeolite is found in countries where the action of subterraneous fire is still visible, and where there is reason to believe that the whole soil has been ravaged by that principle. Thus it abounds in Iceland, where the flames of Hecla yet continue to blaze; and in the isle of Bourbon, where there is still a volcano in force. It is therefore supposed to arise from the decomposition of the products of a volcano, where the fires have been long extinct.

7. Crystals of schorl appear in great plenty among many kinds of our bafaltes; and these, though not absolutely limited to volcanic countries, yet being found in great abundance among the Italian lavas, in circumstances exactly corresponding to those of our bafaltes, are thought to supply a good probable argument in the present case.

8. The peperino stone is thought to be undoubtedly of a volcanic origin. It has frequently the burnt and spongy appearance of many of the volcanic products;

and that of the Giant's Causeway agrees exactly with the peperino of Iceland and Bourbon.

9. Puzzolane earth is met with among the bafaltes of France; and there is very little reason to doubt that our bafaltes, if pulverised, would agree with it in every respect; that is, it would produce a fine sharp powder, containing the same elementary parts, and probably agreeing with it in its valuable uses as a cement. This earth is also found in the Canary islands, which are thought to have other marks of fire; it is met with in all the volcanised parts of Italy, and is never found excepting where there are other evident marks of fire.

10. Pumice stone is universally allowed to be produced by fire, and indeed bears the resemblance of a cinder so obviously, that one must be instantly convinced of its original. This is also found among the bafaltes of Ireland.

11. There are three living volcanoes, within whose neighbourhood the bafaltes and most of its usual attendant fossils have been observed, viz. *Ætna* in Sicily, *Hecla* in Iceland, and the island of *Bourbon* on the coast of Africa. To which it may be added, that it is found throughout all the volcanised parts of Italy, though not any where immediately in the neighbourhood of *Vesuvius*. Sir William Hamilton, however, informs us, that in the year 1779 he "picked up some fragments of large and regular crystals of close-grained lava or basalt; the diameter of which, when the prisms are complete, might have been eight or nine inches." He observes, that *Vesuvius* does not exhibit any lavas regularly crystallized, and forming what are called *Giant's Causeways*, except a lava that ran into the sea, near *Torre del Greco*, in the year 1631, which has a small degree of such an appearance. As the fragments of bafaltes which he found on this mountain, however, had been evidently thrown out of the crater in their proper form, he puts the question, "May not lavas be more ready to crystallize within the bowels of a volcano than after their emission? And may not many of the *Giant's Causeways* already discovered be the nuclei of volcanic mountains, whose lighter and less solid parts may have been worn away by the hand of time?" Mr *Faujais de St Fond* gives an example of basalt columns placed deep within the crater of an extinguished volcano.

12. It is well ascertained by experience, that there are vast beds of pyrites dispersed through the interior parts of the earth at all depths; and it is also a certain fact, that this compound substance may be decomposed by the accidental effusion of water, in such a manner as to become hot, and at last to burn with great fury. This accession of pyrites is by many supposed to be the true origin of the volcanic fire; and an argument for this is, that the present volcanoes do pour forth great quantities of the component parts of pyrites, particularly sulphur, iron, and clay. Now, among the superinduced substances of the county of *Antrim*, and the same may probably be said of every other basaltic country, it is certain that the quantity of iron and clay diffused through almost every species of fossil, amounts to more than one-half of the whole material; so that two of the principal elements of the pyrites are still found there, reduced in many instances to

13
Of the bafaltes thrown out by *Vesuvius*.

Fig. 1.



Fig. 2.



At Bell Prin. Wal. Sculptor fecit.

BARBARA

1844

Basaltes. to a slag or scoria. The third principle, viz. the sulphur, cannot be expected to remain; because sulphur is totally consumed by combustion; and what might perhaps escape and be sublimed would no doubt have since perished by decomposition, in consequence of being exposed to the air.

14
Glas sometimes appears in the form of prismatic crystals.

13. Another argument, which to Sir William Hamilton appears very convincing is, that glass sometimes takes on the appearance of prisms or crystallizes in cooling. He received some specimens of this kind from Mr Parker of Fleet-street, who informed him that a quantity of his glass had been rendered unserviceable by taking such a form. Some of these were in laminæ which may be easily separated, and others resemble basaltic columns in miniature, having regular faces. "Many of the rocks of lava in the island of Ponza (says he) are, with respect to their configurations, strikingly like the specimens of Mr Parker's glass above mentioned; none being very regularly formed basaltes, but all having a tendency towards it. Mr Parker could not account for the accident that occasioned his glass to take the basaltic form; but I have remarked, both in Naples and Sicily, that such lavas as have run into the sea are either formed into regular basaltes, or have a great tendency towards such a form. The lavas of Mount *Ætna*, which ran into the sea near *Jacic*, are perfect basaltes; and a lava that ran into the sea from *Vesuvius*, near *Torre del Græco* in 1631, has an evident tendency to the basaltic form."

15
Lavas which run into the sea have a tendency to run into basaltes.

16
Arguments in opposition to the volcanic theory.

17
Answered.

In opposition to these arguments it is urged, that in many of the countries where basaltes most abound, there are none of the characteristics of volcanic mountains. They assert, therefore, that the basaltes is a fossil, very extensively spread over the surface of the earth; and that, where it is found in the neighbourhood of volcanic mountains, we ought to suppose these to be accidentally raised on a basaltic soil rather than to have created it. But the advocates for the volcanic system are not much embarrassed with this argument. According to them, the basaltes has been formed under the earth itself, and within the bowels of these very mountains; where it could never have been exposed to view until, by length of time or some violent shock of nature, the incumbent mass must have undergone a very considerable alteration, such as should go near to destroy every exterior volcanic feature. In support of this it may also be observed, that the promontories of *Antrim* do bear evident marks of some very violent convulsion, which has left them in their present situation; and that the island of *Ragherry*, and some of the western isles of *Scotland*, do really appear like the surviving fragments of a country, great part of which might have been buried in the ocean. It is further added, that though the exterior volcanic character be in great measure lost in the basaltic countries; yet this negative evidence can be of little weight, when we consider, that the few instances where the features have been preserved afford a sufficient answer to this objection. Thus the *Montagne de la Coupe* in *France* still bears the marks of its having been formerly a volcano; and this mountain is observed to stand on a base of basaltic pillars, not disposed in the tumultuary heap into which they must have been thrown by the furious action of a volcanic eruption, tearing up the natural soil of the country; but arranged in all

the regularity of a Giant's Causeway, such as might be supposed to result from the crystallization of a bed of melted lava, where rest and a gradual refrigeration contributed to render the phenomenon as perfect as possible.

To these arguments stated by Mr Hamilton we shall add another from Mr Ferber; viz. That at the time he went from Rome to Ostia they were paving the road with a species of black lava. In some of the broken pieces he observed little empty holes, of the bigness of a walnut, incrustated all around their sides by white or amethystine semipellucid, pointed, or truncated pyramidal crystallizations, entirely resembling the agate nodules or geodes, which are commonly filled with quartz crystallizations. There was no crack or fissure in the ambient compact lava; the crystal sherls were pretty hard, and might rather be called *quartz*. Some fine brownish dust lay in the rest of the holes, as impalpable and light as ashes. He tells us also, that in the greatest part of the *Paduan*, *Veronese*, and *Vicentine* lavas, we meet with an infinite quantity of white polygonal sherl crystallizations, whose figure is as regular, and still more polygonal, than the basaltes.

These may be considered as the principal arguments in favour of the volcanic theory of basaltes. On the other hand, the late celebrated Mr Bergman expresses himself to the following purpose.

"Ten years ago it was a general opinion, that the surface of the earth, together with the mountains, had been produced by moisture. It is true that some declared fire to be the first original cause, but the greater number paid little attention to this opinion. Now, on the contrary, the opinion that subterraneous fire had been the principal agent gains ground daily; and every thing is supposed to have been melted, even to the granite. My own opinion is, that both the fire and water have contributed their share in this operation; though in such a proportion, that the force of the former extends much farther than the latter; and, on the contrary, that the fire has only worked in some parts of the surface of the earth. It cannot be doubted that there has been some connection betwixt the basaltic pillars and subterraneous fire; as they are found in places where the marks of fire are yet visible; and as they are even found mixed with lava, tophus, and other substances produced by fire.

"As far as we know, nature makes use of three methods to produce regular forms in the mineral kingdom. 1. That of crystallization or precipitation; 2. The crusting or settling of the external surface of a liquid mass while it is cooling; and, 3. The bursting of a moist substance while it is drying.

"The first method is the most common; but to all appearance, nature has not made use of it in the present case. Crystals are seldom or never found in any quantity running in the same direction; but either inclining from one another, or, what is still more common, placed towards one another in sloping directions. They are also generally separated a little from one another when they are regular. The nature of the thing requires this, because the several particles of which the crystals are composed must have the liberty of obeying that power which affects their constitution. The basaltic columns, on the contrary, whose height is frequently from 30 to 40 feet, are placed parallel to one another

Basaltes.

18
Mr Ferber's argument from the crystals found in black lava.

19
Mr Bergman's theory.

20
Both fire and water contribute to form basaltes.

21
Of the methods by which mineral crystals are naturally formed.

Bafaltes.

another in considerable numbers, and so close together that the point of a knife can hardly be introduced between them. Besides, in most places, each pillar is divided into several parts or joints, which seem to be placed on one another. And indeed it is not uncommon for crystals to be formed above one another in different layers, while the solvent has been visibly diminished at different times: but then the upper crystals never fit so exactly upon one another as to produce connected prisms of the same length or depth in all the strata taken together; but each stratum, separately taken, produces its own crystals.

"Precipitation, both in the wet and dry way, requires that the particles should be free enough to arrange themselves in a certain order; and as this is not practicable in a large melted mass, no crystallizations appear, except on its surface or in its cavities. Add to this, that the basalt in a fresh fracture do not show a plain smooth surface under the microscope; but appear sometimes like grains of different magnitude, and at other times resemble fine rays running in different directions, which does not correspond with the internal structure of crystals.

"Hence the opinion of basalt being formed by crystallization either in the wet or dry method must become less probable; but it must not be omitted, that the spars exhibit a kind of crystallization, which at first sight resembles a heap of basaltes, but upon a closer examination a very great difference is to be found. The form of the spar is every where alike, but the basaltes differ from one another in size and the number of their sides. The former, when broken, consists of many small unequal cubes; but the basalt does not separate in regular parts, &c. &c.

"Nature's second method of producing regular forms is that of crusting the outer surface of a melted mass. By a sudden refrigeration, nature, to effect this purpose, makes use of polyhedrous and irregular forms. If we suppose a considerable bed which is made fluid by fire, and spread over a plain, it evidently appears that the surface must first of all lose the degree of heat requisite for melting, and begin to congeal. But the cold requisite for this purpose likewise contracts the uppermost congealed stratum into a narrower space; and consequently causes it to separate from the remaining liquid mass, as the side exposed to the air is already too stiff to give way. In this manner a stratum is produced, running in a parallel direction with the whole mass; others are still produced by the same cause in proportion as the refrigeration penetrates deeper. Hence we may very plainly see how a bed may be divided into strata. In the same manner the refrigeration advances on the sides; which consequently divides the strata into polyhedrous pillars, which can hardly ever be exactly square, as the strongest refrigeration into the inner parts of the mass advances almost in a diagonal line from the corners. If we add to this, that a large mass cannot be equal through its composition, nor every where liquid in the same degree, it will be easy to discover the cause of several irregularities. If the depth of the bed be very considerable in proportion to its breadth, prismatic pillars without cross divisions will be formed at least lengthwise from the uppermost surface downwards.

"The third way is perfectly similar to the prece-

ding in its effect; but it is different from it by the mass being soaked in water, and by the bursting of it asunder, being the effect of the contraction while it is drying. If we suppose such a bed to be spread over a level space, the drying advances in the same manner as the refrigeration in the former case. This separation into strata properly happens when a considerable quantity of clay enters into the whole composition, because the clay decreases more than any other kind of earth in drying.

"It is most probable, therefore, that the pillars have been produced out of the basaltic substance while it was yet soft, or at least not too hard to be softened by exhalations. If we therefore suppose a bed to be spread over a place where a volcano begins to work, it is evident that a great quantity of the water always present on such occasions must be driven upwards in exhalations or vapours; which, it is well known, possesses a penetrating, softening power, by means of which they produce their first effect: but when they are increased to a sufficient quantity, they force this tough moist substance upwards; which then gradually falls, and during this time bursts in the manner above described.

"The reasons for this supposition are as follows: 1. We do not find the internal substance of the basalt melted or vitrified; which, however, soon happens by fusion; and for which only a very small degree of fire is requisite. It is of consequence very hard to explain how this substance could have been so fluid that no traces of bubbles appear in it; and yet, when broken, seem dull and uneven. Lava is seldom vitrified within; but the great number of bubbles and pores which are found in the whole mass, are more than sufficient proofs, that it has not been perfectly melted to its smallest parts, but has only been brought to be near fluid. Secondly, the basalt so much resembles the finer trapp, both in their grain and original composition, that they can hardly be distinguished in small fragments."

Mr Kirwan is of opinion, that the basaltes owe their origin both to fire and water; they seem to have been at first a lava; but this, while immersed in water, so diffused or dissolved in it with the assistance of heat, as to crystallize when cold, or coalesce into regular forms. That basaltes is not the effect of mere fusion, he concludes from comparing its form with its texture. Its form, if produced by fusion, ought to be the effect of having flowed very thin; but in that case its texture should be glassy: whereas it is merely earthy and devoid of cavities. Hence we may understand how it comes to pass that lava perfectly vitrified, and even water, have been found inclosed in basaltes.

Mr Houel in his *Voyage Pittoresque*, is at considerable pains to account for the origin of the different species of basaltes he met with in the neighbourhood of *Ætna*. "Some modern writers, (says he) attribute the configuration of the basaltes to the sudden cooling of the lava in consequence of the effects produced upon it by the coldness of sea-water, when it reaches the sea in a state of fusion. They suppose that the shock, which it then receives, is the cause of those different configurations which this substance assumes; the most remarkable of which have been already mentioned. This assertion, however, seems to be ill founded. By considering

Bafaltes.

22

How the basaltes have been formed, according to this theory.

23

Reasons for supposing that the basaltes has not been melted.

24

Mr Kirwan's opinion.

25

Mr Houel's theory.

Bafaltes.

considering the basaltic rock, the first of the cyclops represented in the plate, we find that the pile is not in its original state, and that the series of columns is at present incomplete. It is very probable, that the species of clay found there, and which is extraneous to the bafaltes, has by some means taken possession of its place; and it likewise appears, that not one of the bafaltes here described is entire.

"It seems incredible, however, that a mass of matter reduced by fire to a state of liquefaction, and flowing into the sea, should be suddenly changed into regular figures by the shock of coming into contact with cold water; and that all the figures which are thus formed should be disposed in the same manner with regard to one another. For if we suppose that the water made its way into the cavity of the lava at the instant when it retreated backwards, then might the same quantity of water penetrate into the most remote parts of the mass; and by that means prolong the cavity which it had begun to form when it first entered the mass. The water then being lodged within this burning mass, and being in a state of dilatation, would have expelled whatever opposed it, and swelled the whole mass in such a manner as to form much larger interstices than those which appear between the basaltic columns; since these are every where in close contact with one another. Besides, how could the sudden cooling of the lava divide the upper part and sides of such an enormous mass as exactly as if they had been cast in a mould made on purpose?

"It remains also for those who adopt the hypothesis in question to explain how the shock occasioned by the cold water should make itself felt beyond a certain depth; since the very first moment it comes into contact with the liquid lava it must cease to be cold; for the lava cannot but communicate to it a greater degree of heat than it communicates of cold in return, as the water is more easily penetrable by the burning lava than the mass of lava by the surrounding water. But farther, if at the first moment after the lava enters the water it were cooled and contracted, the water would soon prevent, by the contraction of its whole surface, any continuation of the effect which it had first occasioned.

"This seems to be the great difficulty: for how is it thus possible for the water to extend its influence to the centre of any very considerable mass; and even supposing it to act at the centre, how could it be able to fix the common centre of all the different columns?

"Let us next consider what a degree of ebullition must take place in the water when it receives such a vast quantity of lava heated not only more intensely than common fire, but than red-hot iron! Though that mass, 100 fathoms in diameter, were to proceed from the bottom of the sea; or though it were immersed in it, the degree of ebullition would still be the same; and it is difficult to conceive what shock can be occasioned by a cold which does not exist, on a mass which burns, or causes to boil, whatever comes near it.

"One peculiarity attending the bafaltes is, that it remains fixed in the recess which it has once occupied. Another, not less essential, is its power of dividing itself in the midst of any one of its hardest parts*, and to form two distinct pieces, one of which is always con-

cave and the other convex; a division which seems the most singular curiosity of the whole.

"A third peculiarity might still be found in the interior part of these columns, if we were to meet with any that had suffered more by the lapse of time than those already described; but it is impossible for all this to be effected by water. How can water, which is every where the same, and which may be expected always to produce the same effects, produce such a variety on bafaltes by mere contact?

"The cause of all these varieties, therefore, seems to be this, that these lavas are originally composed of materials extremely different in their natures, and from which such a variety of effects naturally proceed. The same species of matter, when actuated by the same cause, will constantly produce the same effects. This variety of effects, therefore, is much less owing to the influence of the water than to the variety of materials of which those lavas are composed; and these are combined in different forms and quantities, according to the nature and quantity of the various materials which have been reduced by the volcano to a state of fusion.

"The forms of the bafaltes therefore proceed from two causes. One of them, viz. the cooling, belongs indifferently to every species, independent of its meeting with water. The other is the diversity of the quantities and of the materials of which the lava is composed. From these causes alone proceed all the beauties and varieties which are beheld with admiration in this class of bodies. These take place, from the most irregular fractures in the lava, to those which display the greatest exactness and symmetry. Every new erupted lava differs from those which preceded it, and from those which will follow. In the various principles of these lavas we must seek for the causes of those cavities discoverable in the bafaltes, and for the causes which produce those bafaltes, at the time when the matter of which it is composed contracted itself, and consolidated all its parts. In the act of condensation it appears to have formed various foci, around which we may distinguish the line which sets bounds to the power of each of them; and this is the line which marks the spaces intervening between the different pieces; because all of them are possessed of the same attractive force. The fire emitted by the lava, at the time the bafaltes is formed, produces upon it the same effect that is produced by the evaporation of the aqueous moisture from those bodies where water forms a part of the original constitution; which bodies harden in proportion as they become dry, by reason of the approach of their constituent parts to one another. The abstraction of fire produces the same effect upon bafaltes, by suffering its component parts to come into closer union.

"A new proof of this theory is deducible from the form of the bafaltes represented Plate XCIV. fig. 2. The interstices there are pretty numerous; because the lava being of that species denominated *dirty*, and consisting of parts most of which have but little solidity, they have left much larger spaces between them at their contraction. From this want of solidity we may perceive how much the basaltic mass lost of the fire by which it was dilated while in a state of fusion.

"The void spaces left by the contraction of the bafaltes,

* See
Pl. XCIII.
fig. 2, c.

Bafaltes
||
Bafart-
schik.

faltes, are filled with a spongy matter, which by drying has also left large interstices; and these have been filled in their turn with a kind of yellow matter similar to that which covers the promontory of Castel d'Iaci.

"Whatever variety of forms we meet with among the bafaltes, and whatever divisions and subdivisions may be observable among these varieties, they are owing, 1. To the minuteness, 2. To the homogeneous nature, or, 3. To the diversity among the particles which compose the bafaltes. Among the varieties already enumerated, we find reddish, earthy, soft, and porous substances, together with the zeolite crystals. We see others extremely hard and compact, very finely grained, and containing likewise schoel and zeolite crystals. Others are very hard and dense, which appear to be a mixture of small grey and white bodies; and of each of these colours many different shades, from light to darker, containing also zeolite crystals. Lastly, we find some consisting of a matter similar to clay, mixed with round black sand.

"It may be objected, that the late eruptions of *Ætna* afford no bafaltes, nor have they any divisions similar to those above mentioned. But to this we may reply, that if they afford neither such bafaltes, nor such regular divisions, the reason is, that neither their quantity, nor the ingredients of which they are composed, are such as are necessary for the production of bafaltes: and for a proof of this we may refer to lavas of the most remote antiquity, which have no more resemblance to bafaltes than those that are more modern.

"Lastly, an argument, to which no plausible reply can be made, that the bafaltes are not formed by seawater, is, that in the year 1669, the lava of mount *Ætna* ran into the sea for two leagues and an half, without having the least appearance of being converted into bafaltes."

BASAN, or **BASHAN**, (anc. geog.), a territory beyond Jordan, mentioned in scripture. By Josephus, Eusebius, and Jerom, it is called *Batanea*. On the entering of the Israelites into the land of Canaan, the whole of the country beyond Jordan, from that of the Moabites, or Arabia, as far as mount Herman and Lebanon, was divided into two kingdoms, viz. that of Sihon king of the Amorites, and of Og king of Basan or *Bassan*; the former to the south, and the latter to the north. The kingdom of Sihon extended from the river Arnon and the country of Moab to the river Jabbok; which running in an oblique course from the east, was at the same time the boundary of the Ammonites, as appears from Numb. xxi. 24. and Deut. ii. 37. and iii. 16. The kingdom of Sihon fell to the lot of the Reubenites and Gadites, and Basan to the half-tribe of Manasseh. To this was annexed a part of the hilly country of Gilead, and the district of Argob; yet so that Basan continued to be the principal and greatest part: but after the Babylonish captivity, Basan was subdivided; so that only a part was called *Batanea* or *Basan*, another *Trahonitis*, a third *Auranitis* or *Iturea*, and some part also *Gaulonitis*; but to settle the limits of each of these parts is a thing now impossible.—Basan was a country famous for its pastures and breed of large cattle.

BASARTSCHIK, a considerable town of Romania in Turkey of Europe. It is pretty well built,

and hath clean and broad streets; has a great trade; and is situated on the river Meritz, in E. Long. 24. 30. N. Lat. 41. 49.

BASARUCO, in commerce, a small base coin in the East Indies, being made only of very bad tin. There are, however, two sorts of this coin, a good and a bad; the bad is one-sixth in value lower than the good.

BASE, in geometry, the lowest side of the perimeter of a figure: Thus, the base of a triangle may be said of any of its sides, but more properly of the lowest, or that which is parallel to the horizon. In rectangled triangles, the base is properly that side opposite to the right angle.

Base of a Solid Figure, the lowest side, or that on which it stands.

Base of a Conic Section, a right line in the hyperbola and parabola, arising from the common intersection of the secant plain and the base of the cone.

BASE, in architecture, is used for any body which bears another, but particularly for the lower part of a column and pedestal.—The ancients, in the early times of architecture, used no bases. The Doric columns in the temple of Minerva at Athens have none, but stand immediately upon the floor of the porch. Columns afterwards came to be supported on square pieces called *plinths*, and after that on pedestals. When we see a column, of whatsoever order, on a pedestal, the base is that part which comes between the top of the pedestal and the bottom of the shaft of the column; when there is no pedestal, it is the part between the bottom of the column and the plinth: some have included the plinth as a part of the base; but it is properly the piece on which the base stands, as the column stands upon that.—The pedestal also has its base as well as the column, and the pilaster. The base of columns is differently formed in the different orders; but in general it is composed of certain spires or circles, and was thence in early times called the *spire of a column*. These circles were in this case supposed to represent the folds of a snake as it lies rolled up; but they are properly the representations of several larger and smaller rings or circles of iron, with which the trunk of trees which were the ancient columns were surrounded to prevent their bursting: these were rude and irregular, but the sculptor who imitated them in stone found the way to make them elegant.

BASE, in fortification, the exterior side of the polygon, or that imaginary line which is drawn from the flanked angle of a bastion to the angle opposite to it.

BASE, in gunnery, the least sort of ordnance, the diameter of whose bore is $1\frac{1}{4}$ inch, weight 200 pound, length 4 feet, load 5 pound, shot $1\frac{1}{2}$ pound weight, and diameter $1\frac{1}{8}$ inch.

BASE, in chemistry. See **BASIS**.

BASE, in law. *Base estate*, such as base tenants have in their hands. *Base tenure*, the holding by villenage, or other customary services; as distinguished from the higher tenures *in capite*, or by military service. *Base fee*, is to hold in fee at the will of the lord, as distinguished from socage tenure. *Base court*, any court not of record.

BASELLA, CLIMBING NIGHTSHADE from *Malaria*: A genus of the trigynia order, belonging to the pentandria class of plants; and in the natural method ranking

Bafaruce
||
Basella.



Fig. 2.



Bafella
||
Bafhaw.

ranking under the 12th order, *Holoracea*. The calyx is wanting; the corolla is seven-clift, with the two opposite divisions broader, and at last berried: there is one feed.

Species. 1. The rubra, with red leaves and fimple footstalks, has thick, ftrong, fucculent ftalks and leaves, which are of a deep purple colour. The plant will climb to the height of ten or twelve feet, provided it is kept in a ftove; but in the open air it will not grow fo large in this country; nor will the feeds come to perfection in the open air, unlefs in very warm feafons. The flowers of this plant have no great beauty, but it is cultivated on account of the odd appearance of its ftalk and leaves. There is a variety of this with green ftalks and leaves, and the flowers of a whitifh green colour tipped with purple. 2. The alba, with oval waved leaves. This fort hath flaccid leaves, and fmall flowers and fruit than the firft. The plant will climb to a confiderable height, and fend forth a great number of branches; fo they fhould be trained up to a trellis, or faftened to the back of the ftove, otherwife they will twift themfelves about whatever plants ftand near them, which will make a very difagreeable appearance.

Culture. Thefe plants are propagated from feeds, which fhould be fown on a moderate hot-bed in the fpring; and when the plants are fit to remove, they fhould be each planted on a feparate pot, and plunged into the tan-bed, where they are to be treated like other tender exotics. They may be alfo propagated from cuttings; but as they arife fo eafily from the feeds, the latter method is feldom praftifed.

Ufes. The berries of the firft fpecies are faid to be ufed for ftaining callicoës in India. Mr Miller affures us, that he has feen a very beautiful colour drawn from them, but which did not continue long when ufed in painting. He is of opinion, however, that a method of fixing the colour might be invented, in which cafe the plant would be very ufeul. This, we apprehend, might be accomplifhed by means of folution of tin in aqua regia, which hath a furprifing effect both in brightning and giving durability to other vegetable colours.

BASEMENT, in architecture. See ARCHITECTURE, N^o 70, 71.

BASHARIANS, a feft of Mahometans, being a branch or fubdivifion of the Motazalites. The Bafharians are thofe who maintain the tenets of Bafhar Ebn Motamer, a principal man among the Motazalites, who varied, in fome points, from the general tenets of the feft, as carrying man's free agency to a great length, and even to the making him independent.

BASHAW, a Turkish governor of a province, city, or other diftrict.

A bafhaw is made with the folemnity of carrying a flag or banner before him, accompanied with mufic and fongs by the mirialem, an officer on purpofe for the inveftiture of bafhaws. *Bafhaw*, ufed abfolutely, denotes the prime vizier; the reft of the denomination being diftinguifhed by the addition of the province, city, or the like, which they have the command of; as the bafhaw of Egypt, of Paleftine, &c. The bafhaws are the emperor's fponges. We find loud complaints among Chriftians of their avarice and extortions. As they buy their governments, every thing is venal

with them. When gluttred with wealth, the emperor frequently makes them a prefent of a bow ftirng, and becomes heir to all their fpoils.

The appellation *Bafhaw* is given by way of courtefy to almoft every perfon of any figure at the grand fignior's court.

BASIL (St) the Great, one of the moft learned and eloquent doftors of the church, was born at Cæfarea, in Cappadocia, about the year 328; and went to finifh his ftudies at Athens, where he contracted a ftrict friendship with St Gregory Nazianzen. He returned to his native country in 355, where he taught rhetoric. Some time after, he travelled into Syria, Egypt, and Lybia, to vifit the monafteries of thefe countries; and the monaftic life fo much fuitd his difpofition, that upon his return home he refolved to follow it, and he was the firft institutor thereof in Pontus and Cappadocia. His reputation became fo bright, that, upon the death of Eufebius bifhop of Cæfarea, in 370, he was chofen his fucceffor. It was with fome difficulty that he accepted of this dignity; and no fooner was he raifed to it, than the emperor Valens began to perfecute him becaufe he refufed to embrace the doctrine of the Arians. Being at length let alone, he began to ufe his utmoft endeavours to bring about a reunion betwixt the eaftern and weftern churches, who were then much divided about fome points of faith, and in regard to Meletius and Paulinus two bifhops of Antiochia. But all his efforts were ineffectual, this difpute not being terminated till nine months after his death. Basil had a fhare in all the difputes which happened in his time in the eaft in regard to the doctrine of the church; and died the 1ft of January, 379. There have been feveral editions of his works in Greek and Latin. The beft is that of Father Garnier, printed in Greek and Latin, in three volumes folio. St Basil's ftyle is pure and elegant, his expreffions are grand and fublime, and his thoughts noble and full of majefty. Erasmus places him among the greateft orators of antiquity.

BASIL, a canton of Switzerland, which joined the confederacy in 1501. It is bounded on the fouth by the canton of Solothurn; on the north by part of the margravate of Baden Dourlach, and the territory of Rheinfelden; on the eaft by Frickthal; and on the weft by part of Solothurn, the diocefe of Bafil, and the Sungare; being upwards of 20 miles in length, and about 18 in breadth. It is entirely Proteftant; and contains 27 parifhes, and feven bailiwicks. The lower parts of it are fruitful in corn and wine, and alfo fit for pafuture; but the mountains are extremely barren. Here are many medicinal fprings and baths, and the air is wholefome and temperate. Both men and women for the moft part wear the French drefs; but the language commonly fpoken is the High-Dutch, tho' the French alfo is much ufed. The government is ariftocratical; and its revenues arife chiefly from fecularized abbeys, and imposts on goods carried through the country, to and from France, Italy, and Germany. Befides the military eftablifhment of the city of Bafil, there are two provincial regiments, confifting each of ten companies, and a troop of dragoons. The places of moft note are Bafil the capital, Wallenburg, St Jacob, Neue-Haus, &c.

BASIL, the capital of the canton of that name, is the

Bafil.

Basil.

the largest city in all Switzerland, having 220 streets, and six market-places or squares. Its environs are exceeding beautiful, consisting of a fine level tract of fields and meadows. The city is divided into two parts by the Rhine, over which there is a handsome bridge. It is thought by some to have risen on the ruins of the old Augusta Rauracorum. For its name of *Basilia* it is indebted to Julian the Apostate, who would have it so called in honour of his mother Basilina. It is fortified with walls, moats, towers, and bastions, and contains several churches, besides the cathedral, which is an old Gothic structure; a commandery of the order of St John, and another of the Teutonic order; a public granary and arsenal; a stately town-house, in which is an exquisite piece of the sufferings of Christ, by Holbein, and a statue of Munatius Plancus, a Roman general, who, about 50 years before Christ, built the ancient city of Augusta Rauracorum; and university, which was founded in 1459, and has a curious physic-garden, library, and museum; a gymnasium; a stately palace, belonging to the margrave of Baden-Durlach; besides a chamber of curiosities, several hospitals, &c. In the arsenal is shown the armour in which Charles the Bald lost his life, with the furniture of his horse, and the kettle-drums and trumpets of his army. On the stair-case of the council-house, is a picture of the last judgment, in which, though drawn before the Reformation, popes, cardinals, monks, and priests, are represented in the torments of hell. Over-against the French church, on a long covered wall, is painted the dance of death; where the king of terrors is represented as mixing with all ranks and ages, and complimenting them, in German verses, on their arrival at the grave. St Peter's square, planted with elm and lime-trees, makes a pleasant walk; but a spot regularly planted with trees, close by the river, and near the minster, makes still a finer, as commanding a most beautiful and extensive prospect. The celebrated Erasmus died here in 1536, in the 70th year of his age, and was buried in the great church. He left his library and cabinet of rarities to one Amberbach, a learned lawyer of this city, of whose heirs they were purchased by the university. Besides this cabinet, there are several other curious private ones. The clocks of this city go an hour faster than elsewhere, except at Constance; a circumstance which some ascribe to the famous councils held there, when it was thought the best expedient to bring the fathers earlier to the assembly, for the quicker dispatch of business; but others say, that, in Basil, it was owing to an assault being defeated by that means. About 400 years ago, according to the story, the city was threatened with an assault by surprise. The enemy was to begin the attack when the large clock of the tower at one end of the bridge should strike one after midnight. The artist who had the care of the clock, being informed that this was the expected signal, caused the clock to be altered, and it struck two instead of one; so the enemy thinking they were an hour too late, gave up the attempt: and in commemoration of this deliverance, all the clocks in Basil have ever since struck two at one o'clock, and so on. In case this account of the matter should not be satisfactory, they show, by way of confirmation, a head, which is placed near to this patriotic clock, with the face

turned to the road by which the enemy was to have entered. This same head lolls out its tongue every minute, in the most insulting manner possible. This was originally a piece of mechanical wit of the famous clockmaker's who saved the town. He framed it in derision of the enemy, whom he had so dexterously deceived. It has been repaired, renewed, and enabled to thrust out its tongue every minute for these four hundred years, by the care of the magistrates, who think so excellent a joke cannot be too often repeated. Trade still flourishes here, especially in silk, ribbons, and wines; and the police is under excellent regulations. Most of the offices are bestowed by lot among well qualified persons. No person, without the city, must wear lace of gold or silver. All young women are prohibited from wearing silks; and the nearest relations only are to be invited to a marriage-feast. For the government of the city there are several councils or colleges, and officers. Of the last, the two burgomasters, and two wardens of trades, are the chief. The great council is composed of the representatives of the several companies of the greater and lesser city. Basil was the see of a bishop till the Reformation; but though there is one that still bears the title, he has now no jurisdiction here, and lives at Porentru, near the Upper Alsace. The two Buxtorffs, father and son, and the famous painter Holbein, were natives of this place. The council held here, in 1431, sat in the vestry of the cathedral.

BASIL, in botany. See OCYMUUM.

BASIL, among joiners, the sloping edge of a chissel, or of the iron of a plane, to work on soft wood: they usually make the basil 12 degrees, and for hard wood 18; it being remarked, that the more acute the basil is, the better the instrument cuts; and the more obtuse, the stronger, and fitter it is for service.

BASILEUS, βασιλεὺς, a title assumed by the emperors of Constantinople, exclusive of all other princes, to whom they give the title *rex*, "king." The same quality was afterwards given by them to the kings of Bulgaria, and to Charlemagne, from the successors of which last they endeavoured to wrest it back again.

The title *Basileus* has been since assumed by other kings, particularly the kings of England, *Ego Edgar totius Anglie basileus confirmavi*. Hence also the queen of England was intitled *Basilea* and *Basilissa*.

BASILIAN MONKS; Religious of the order of St Basil. That saint, having retired into a desert, in the province of Pontus, founded a monastery for the convenience of himself and his numerous followers: and for the better regulation of this new society, he drew up in writing the orders and rules he would have them follow. This new order soon spread all over the east; nor was it long before it passed into the west. The rule of St Basil was approved by Pope Liberius, the same year in which it was written and published; and afterwards by several other popes; and, in these last ages, by Pope Gregory XIII. who approved the abridgement made of it by Cardinal Bessarion, in the pontificate of Eugenius IV. Some authors pretend, that St Basil, before he died, saw himself the spiritual father of more than 90,000 monks, in the east only. But this order, which flourished so greatly for more than three centuries, was afterwards considerably diminished

Basil

||
Basilian.

Basilic. by heresy, schism, and a change of empire. The greatest storm it felt, was in the reign of Constantine Copronymus; who persecuted the monks of St Basil, imprisoning some, and banishing others; insomuch that the monasteries were abandoned and spoiled of all their goods.

The historians of this order tell us, that it has produced 1805 bishops; and beatified, or acknowledged as saints, 3010 abbots, 11,805 martyrs, and an infinite number of confessors and virgins. They likewise place among the religious of the order of St Basil 14 popes, some cardinals, and a very great number of patriarchs, archbishops, and bishops. This order likewise boasts of several emperors and empresses, kings and queens, princes and princesses, who have embraced its rule.

This order was introduced in the west in 1057; and was reformed in 1569, by pope Gregory XIII. who united the religious of this order in Italy, Spain, and Sicily, into one congregation; of which the monastery of St Saviour at Messina is the chief, and enjoys pre-eminence over the rest. Each community has its particular rule, besides the rule of St Basil, which is very general, and prescribes little more than the common duties of a Christian life.

BASILIC, or **BASILICA**, in the ancient architecture, denotes a kind of public hall or court of judicature, where the princes or magistrates sat to administer justice. The word is originally Greek, βασιλική, *q. d.* royal house, palace.

The basilics consisted of a great hall, with ailes, porticos, tribunes, and tribunals. The bankers too had one part of the basilica allotted for their residence. The scholars also went thither to make their declamations, according to the testimony of Quintilian. In after-times the denomination *basilica* was also given to other buildings of public use, as town-houses, exchanges, burfes, and the like. The Roman *basilica* were covered, by which they were distinguished from the *fora*, which were public places open to the air. The first basilica was built at Rome by Cato the elder, whence it was called *Porcia*; the second was called *Opimia*; the third was that of Paulus, built with a great expence, and with much magnificence, whence it was called by some *regia Pauli*; another was built by Julius Cæsar, called *basilica Julia*; of which Vitruvius tells us he had the direction. There were others also, to the number of eighteen or twenty. The *basilica Julia* not only served for the hearing of causes, but for the reception and audience of foreign ambassadors. It was supported by a hundred marble pillars in four rows, and enriched with decorations of gold and precious stones. In it were 13 tribunals or judgment seats, where the prætors sat to dispatch causes.

BASILIC is also used, in ecclesiastical writers, for a church. In which sense, this name frequently occurs in St Ambrose, St Austin, St Jerom, Sidonius, Apollinaris, and other writers of the fourth and fifth centuries. It is thought that the name was thus applied, from many of the ancient churches having been formed of the Roman halls mentioned in the preceding article. In reality, on the conversion of Constantine, many of the ancient *basilica* were given to the church, and turned to another use, *viz.* for Christian assemblies to meet in, as may be collected from that passage in Ausonius, where speaking to the emperor Gratian, he tells

him, the *basilica*, which heretofore were wont to be filled with men of business, were now thronged with votaries praying for his safety. By which he must needs mean, that the Roman halls or courts were turned into Christian churches: and hence, we conceive, the name *basilica* came to be a general name for churches in after ages.

BASILIC is chiefly applied, in modern times, to churches of royal foundation; as those of St John de Lateran, and St Peter of the Vatican at Rome, founded by the emperor Constantine.

BASILICS were also little chapels built by the ancient Franks over the tombs of their great men, so called, as resembling the figure of the sacred *basilica* or churches. Persons of inferior condition had only *tumba* or *porticuli* erected over them. By an article in the Salic law, he that robbed a *tumba* or *porticulus*, was to be fined fifteen *solidi*; but he that robbed a basilica, thirty *solidi*.

BASILICS, in literary history, a name supposed to have been given by the emperor Leo to a collection of laws in honour of his father Basilus Macedo, who began it in the year 867, and in the execution chiefly made use of Sabbathius Protospatharius, who carried the work as far as 40 books. Leo added 20 books more, and published the work in 880. The whole, 30 years after, was corrected and improved by Constantin Porphyrogenitus, son of Leo; whence many have held him the author of the basilica. Six books of the basilica were translated into Latin in 1557, by Gentian Hervetus. An edition of the Greek basilics, with a Latin version, has been since published at Paris, in 1647, by Annib. Fabrotus, in 7 volumes. There still want 19 books, which are supposed to be lost. Fabrotus has endeavoured to supply in some measure the defect from the synopsis of the basilica, and the glosses; of which several had been made under the succeeding emperors, and contained the whole Justinian law, excepting the superfluities, in a new and more consistent order, together with the later constitutions of the emperors posterior to Justinian.

BASILICA, in anatomy, the interior branch of the axillary vein, running the whole length of the arm.

BASILICATA, a territory of Italy, bounded on the north by the Otranto, Bari, and Capitanata; on the west by the Principato, and a small part of the Tuscan sea; on the south by Calabria; and on the west by the gulph of Taranto. It is watered by several rivers: but as it is almost all occupied by the Apennine mountains, it is neither very populous nor fertile; however it produces enough to maintain its inhabitants, and has a small quantity of cotton. The principal towns are Cirenza the capital, Mesi, Turfi, Rapollo, Muro, Lavello, Tracarico, Monte Pelose, and Veneso, which are all episcopal sees.

BASILICI, a denomination given in the Greek empire to those who carried the emperor's orders and commands.

BASILICON, in pharmacy, a name given to several compositions to be found in ancient medicinal writers. At present it is confined to three official ointments, distinguished by the epithets black, yellow, and green. See **PHARMACY**.

BASILIDIANS, ancient heretics, the followers of Ba-

Basilic

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Basilidians.

Basilippum

Basilisk.

Basilides, an Egyptian, who lived near the beginning of the second century. He was educated in the Gnostic school, over which Simon Magus presided; with whom he agreed that Christ was a man in appearance, that his body was a phantom, and that he gave his form to Simon the Cyrenian, who was crucified in his stead. We learn from Eusebius, that this heresiarch wrote 24 books upon the gospel, and that he forged several prophets; to two of which he gave the names *Barcaba* and *Barcoph*. We have still the fragment of a Basilidian gospel. His disciples supposed there were particular virtues in names; and taught with Pythagoras and Plato, that names were not formed by chance, but naturally signified something.—Basilides, to imitate Pythagoras, made his disciples keep silence for five years.

In general, the Basilidians held much the same opinions with the Valentinians, another branch of the Gnostic family. They asserted, that all the actions of men are necessary; that faith is a natural gift, to which men are forcibly determined, and should therefore be saved though their lives were ever so irregular. Irenæus and others assure us, they acted consistently with their principle; committing all manner of villanies and impurities, in confidence of their natural election. They had a particular hierarchy of divine persons, or *Æons*. Under the name *Abraxas*, they are said to have worshipped the supreme God, from whom, as a principle, all other things proceeded. There are several gems still subsisting, inscribed with the name *Abraxas*, which were used by the Basilidians as amulets against diseases and evil spirits. See *ABRASAX* and *ABRAX*.

BASILIPPUM (anc. geog.), a town of Bætica in Spain; now *Cantillana*, a citadel of Andalusia, above Seville on the Guadalquivir.

BASILISCUS, in zoology, the trivial name of a species of lacerta. See *LACERTA*.

BASILISK, a fabulous kind of serpent, said to kill by its breath or sight only. Galen says, that it is of a colour inclining to yellow; and that it has three little eminences upon its head, speckled with whitish spots, which have the appearance of a sort of crown. *Ælian* says, that its poison is so penetrating, as to kill the largest serpents with its vapour only; and that if it but bite the end of any man's stick, it kills him. It drives away all other serpents by the noise of its hissing. Pliny says, it kills those who look upon it.—The generation of the basilisk is not less marvellous, being said to be produced from a cock's egg, brooded on by a serpent. These, and other things equally ridiculous, are related by *Matthioli*, *Galen*, *Dioscorides*, *Pliny*, and *Erasistratus*. *Hirschmayer* and *Vander Wiel* have given the history of the basilisk, and detected the folly and imposture of the traditions concerning it.—In some apothecaries shops there are little dead serpents shown, which are said to be basilisks. But these seem rather to be a kind of small bird, almost like a cock, but without feathers: its head is lofty, its wings are almost like a bat's, its eyes large, and its neck is very short. As to those which are shown and sold at Venice, and in other places, they are nothing but little thornbacks artificially put into a form like that of a young cock, by stretching out their fins, and contriving them with a little head and hollow eyes: and this, *Calmet* says, he

has in reality observed in a supposed basilisk, at an apothecary's shop at Paris, and in another at the Jesuits of Pont-a-Mousson.

BASILISK, in military affairs, a large piece of ordnance, thus denominated from its resemblance to the supposed serpent of that name. The basilisk throws an iron ball of 200 pound weight. It was much talked of in the time of Solyman emperor of the Turks, in the wars of Hungary; but seems now out of use, *Paulus Jovius* relates the terrible slaughter made by a single ball from one of these basilisks in a Spanish ship; after penetrating the boards and planks in the ship's head, it killed above 30 Men. *Maffeus* speaks of basilisks made of brass, which were drawn each by 100 yoke of oxen.—Modern writers also give the name *basilisk* to a much smaller and sizeable piece of ordnance, which the Dutch make 15 feet long, and the French only 10. It carries 48 pounds.

BASILILIUS, surnamed the *Macedonian* emperor of the Greeks. He was a common soldier, and of an obscure family in Macedonia, and yet raised himself to the throne; for having pleased the emperor Michael by his address in the management of his horses, he became his first equerry, and then his great chamberlain. He at length assassinated the famous Bardas, and was associated to the empire in 849. He held the eighth general council at Constantinople; deposed the patriarch Photius, but in 858 restored him to the patriarchate; and declared against the popes, who refused to admit him into their communion. He was dreaded by his enemies the Saracens, whom he frequently vanquished; and loved by his subjects, for his justice and clemency. He died in 886. Under his reign the Russians embraced Christianity, and the doctrine of the Greek church. He ought not to be confounded with Basilus the Young, who succeeded Zemisces in 975, and after a reign of 50 years died in 1025.

BASINGSTOKE, a corporation-town of Hampshire in England, and a great thoroughfare on the western road. It is seated on a small brook, in W. Long. 1. 10. N. Lat. 51. 20.

BASIOGLOSSUS, a muscle arising from the base of the os hyoides. See *ANATOMY*, *Table of the Muscles*.

BASIS, or base, in geometry. See *BASE*.

BASIS, or *Base*, in chemistry, any body which is dissolved by another body, which it receives and fixes, and with which it forms a compound, may be called the *basis* of that compound. Thus, for example, the bases of neutral salts are the alkaline, earthy, and metallic matters which are saturated by the several acids, and form with them these neutral salts. In this sense it is that these neutral salts are called *salts with earthy bases*, *salts with alkaline bases*, *salts with metallic bases*: also the appellations *basis of alum*, *basis of nitre*, *basis of Glauber's salt*, *basis of vitriol*, &c. signify the argillaceous earth, which, with the vitriolic acid, forms alum; the vegetable alkali, which, with the nitrous acid, forms nitre; the mineral alkali, which, with the vitriolic acid, forms Glauber's salt; and the metal which, with the vitriolic acid, forms a vitriol; because these substances are supposed to be fixed, unactive, and only yielding to the action of the acids, which they fix, and to which they give a body and consistence.

BASIS,

Basilisk

Basis.

Basis
Baskets.

BASIS, among physicians, denotes the principal ingredients in compound medicines.

BASKERVILLE (John), an eminent artist, especially in letter-founding and printing, of the present century. He was born in 1706 at Woverley in Worcestershire, and was heir to an estate of about L. 60 a-year; the whole of which income he allowed to his parents till their deaths. In his early years he conceived a love for fine writing and cutting in stone; and being brought up to no particular profession, he commenced writing-master in Birmingham when about 20 years of age. The improvements in different manufactures there soon drew his attention, and he applied to the japan business, which he carried on for a long time with distinguished excellence and success. In 1750 he applied himself to letter-founding, the bringing of which to perfection cost him much labour and expence. In a few years he proceeded to printing; and his first work was an edition of Virgil on royal quarto, which now sells for three guineas. In a short time he obtained leave from the university of Cambridge to print a Bible in royal folio, and editions of the Common Prayer in three sizes; for which he paid a large sum to the university. He afterwards printed Horace, Terence, Catullus, Lucretius, Juvenal, Sallust, and Florus, in royal quarto; Virgil in octavo; and several books in duodecimo. He published likewise some of the English classics. The best testimonies of the merit of these performances are themselves; and Mr Baskerville's name is deservedly ranked among those who, in modern times, have brought the art of printing to its greatest perfection. Not meeting, however, with that encouragement from the booksellers which he expected, he set up a letter-foundry for sale a little before his death. He died without issue in July 1775.

BASKET, an utensil made of twigs interwoven together, in order to hold fruit, earth, &c. As a measure, it denotes an uncertain quantity; as, a basket of medlars is two bushels, of asafœtida from 20 to 50 pound weight. The ancient Britons were noted for their ingenuity in making baskets, which they exported in large quantities. These baskets were of very elegant workmanship, and bore a high price; and are mentioned by Juvenal among the extravagant expensive furniture of the Roman tables in his time.

Adde et bascaudas et mille escaria.

Add baskets, and a thousand other dishes.

That these baskets were manufactured in Britain, we learn from the following epigram of Martial:

*Babara de pictis veni bascauda Britannis,
Sed me jam mavult dicere Roma suam.*

A basket I, by painted Britons wrought,
And now to Rome's imperial city brought.

BASKETS of Earth, in the military art, called by the French *corbeilles*, are small baskets used in sieges, on the parapet of a trench, being filled with earth. They are about a foot and a half high, about a foot and a half in diameter at the top, and 8 or 10 inches at bottom; so that, being set together, there is a sort of embrasures left at their bottoms, through which the soldiers fire, without exposing themselves.

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BASKET-Fish, a species of sea-star. See **ASTEROIAS**.

BASKET-Salt, that made from salt-springs, being purer, whiter, and composed of finer grains, than the common brine-salt. See **SALT**.

BASKING-SHARK, or *SUN-Fish of the Irish*. See **SQUALUS**.

BASNAGE (James), a learned and accomplished author, and pastor of the Walloon church at the Hague, was born at Roan in Normandy August 8. 1653. He was the son of Henry Basnage, one of the ablest advocates in the parliament of Normandy. At 17 years of age, after he had made himself master of the Greek and Latin authors, as well as the English, Spanish, and Italian languages, he went to Geneva, where he began his divinity studies under Mestrezat, Turretin, and Tronchin; and finished them at Sedan, under the professors Jurieu and Le Blanc de Beaulieu. He then returned to Roan, where he was received as minister, September 1676; in which capacity he remained till the year 1685, when, the exercise of the Protestant religion being suppressed at Roan, he obtained leave of the king to retire to Holland. He settled at Rotterdam, and was a minister pensionary there till 1691, when he was chosen pastor of the Walloon church of that city. In 1709 Pensionary Heinsius got him chosen one of the pastors of the Walloon church at the Hague, intending not only to employ him in religious but in state affairs. He was employed in a secret negociation with Marshal d'Uxelles, plenipotentiary of France at the congress of Utrecht; and he executed it with so much success, that he was afterwards entrusted with several important commissions, all which he discharged in such a manner as to gain a great character for his abilities and address; a celebrated modern writer has therefore said of him, that he was fitter to be minister of state than of a parish. The abbé du Bois, who was at the Hague in 1716, as ambassador plenipotentiary from his most Christian majesty, to negotiate a defensive alliance between France, England, and the States General, was ordered by the Duke of Orleans, regent of France, to apply himself to M. Basnage, and to follow his advice: they accordingly acted in concert, and the alliance was concluded in January 1717. He kept an epistolary correspondence with several princes, noblemen of high rank, and ministers of state, both Catholic and Protestant, and with a great many learned men in France, Italy, Germany, and England. The Catholics esteemed him no less than the Protestants; and the works he wrote, which are mostly in French, spread his reputation almost all over Europe: among these are, 1. The History of the Religion of the Reformed Churches. 2. Jewish Antiquities. 3. The History of the Old and New Testament; and many others. He died September 22. 1723.

BASNAGE (Henry), Sieur de Beauval, second son to Henry Basnage, and brother to James mentioned in the last article. He applied himself to the study of the law, and was admitted advocate in the parliament of Roan in the year 1679. He did not follow the bar immediately upon his admission; but went to Valencia, where he studied under M. de Marville. Upon his return from thence, he practised with great reputation till the year 1687, when the revocation of the edict of

H

Nantz

Baskets
Basnage.

Bafon
||
Bafs.

Nantz obliged him to fly to Holland, where he composed the greatest part of his works, and died there the 29th of March 1710. His chief work is *Histoire des ouvrages des Scavans*. Rotterd. 24 vol. in duodecimo. This work was begun in the month of September 1687, and continued till June 1709. When he arrived in Holland, Mr Bayle, through indisposition, had been obliged to drop his *Nouvelles de la Republique des Lettres*, which induced Mr Basnage to undertake a work of the same kind under a different title.

BASON, in hydraulics, a reservoir of water, used for various purposes: thus we say, *The bason of a jet d'eau*, *the bason of a fountain*, and likewise *the bason of a port or harbour*.

BASON, in Jewish antiquities, the laver of the tabernacle, made of the brass looking-glasses belonging to those devout women that watched and stood centinels at the door of the tabernacle.

BASON, or *Disb*, among glass-grinders. These artificers use various kinds of basons, of copper, iron, &c. and of various forms, some deeper, others shallower, according to the focus of the glasses that are to be ground. In these basons it is that convex glasses are formed, as concave ones are formed on spheres or bowls.

Glasses are worked in basons two ways. In the first, the bason is fitted to the arbor or tree of a lath, and the glass (fixed with cement to a handle of wood) presented and held fast in the right hand within the bason, while the proper motion is given by the foot of the bason. In the other, the bason is fixed to a stand or block, and the glass with its wooden handle moved. The moveable basons are very small, seldom exceeding five or six inches in diameter; the others are larger, sometimes above ten feet diameter. After the glass has been ground in the bason, it is brought smoother with grease and emery; and polished first with tripoli, and finished with paper cemented to the bottom of the bason.

BASON, among hatters, is a large round shell or case, ordinarily of iron, placed over a furnace; wherein the matter of the hat is moulded into form. The hatters have also basons for the brims of hats, usually of lead, having an aperture in the middle, of a diameter sufficient for the largest block to go through.

BASQUES, a small territory of France, towards the Pyrenean mountains. It comprehends Labour, Lower Navarre, and the district of Soule.

BASS, the lowest in the four parts of music: of uncertain etymology; whether from the Greek word *βασίς*, "a foundation;" or from the Italian adjective *basso*, signifying "low." Of all the parts it is the most important, and it is upon this that the chords proper to constitute a particular harmony are determined. Hence the maxim among musicians, that when the bass is properly formed, the harmony can scarcely be bad.

Basses are of different kinds. Of which in their order.

Thorough-Bass is the harmony made by the bass-viol, or theorbo, continuing to play both while the voices sing and the other instruments perform their parts, and also filling up the intervals when any of the other parts stop. It is played by figures marked over the notes, on the organ, spinet, harpsichord, &c. and

frequently simply and without figures on the bass-viol and bassoon.

Counter-Bass is a second or double bass, where there are several in the same concert.

Bass-Viol, a musical instrument of the like form with that of a violin, but much larger. It is struck with a bow as that is; has the same number of strings; and has eight stops, which are subdivided into semi-stops. Its sound is grave, and has a much nobler effect in a concert than that of the violin.

BASS (Isle of), a rock, about a mile in circumference, in the mouth of the Frith of Forth, at a small distance from the town of North Berwick in East Lothian. It is steep and inaccessible on all sides, except to the south-west; and even there it is with great difficulty that a single man can climb up with the help of a rope or ladder. It was formerly kept as a garrison. A party of King James's adherents surprised it at the Revolution, and it was the last place in the three kingdoms that submitted to the new government; upon which its fortifications were ordered to be neglected. In summer, this remarkable rock, which rises to a great height above the water, in form of a cone, is quite covered with sea-fowl which come hither to breed. The chief of these are the solon geese†, which arrive in June, and retire in September. It also contains a small warren for rabbits, and affords pasture for a few sheep. The force of the tides have now almost worn a hole quite through this rock. W. Long. 2. 15. N. Lat. 56. 3.

BASSAN (Giacomo de Pont), or LE BASSAN, a celebrated Venetian painter, was born in 1510. His subjects generally were peasants and villagers, busy at their different rural occupations, according to the various seasons of the year; cattle, landscapes, and historical designs; and in all those subjects the figures were well designed, and the animals and landscapes have an agreeable resemblance of simple nature. His compositions cannot boast of much elegance or grandeur of taste, not even those which are historical; but they have abundance of force and truth. His local colours are very well observed, his carnations are fresh and brilliant, and the chiaro-scuro and perspective well understood. His touch is free and spirited; and the distances in his landscapes are always true, if not sometimes too dark in the nearer parts. His works are spread all over Europe: many of them were purchased by Titian; and there are several in the French king's cabinet, the royal palace, and the Hotel de Toulouse. They are more readily known than those of most other painters; from the similitude of characters and countenances, in the figures and animals; from the taste in the buildings, utensils, and draperies; and, beside, from a violet or purple tint that predominates in every one of his pictures. But the genuine pictures of his hand are not so easily ascertained; because he frequently repeated the same design, and his sons were mostly employed in copying the works of their father, which he sometimes retouched. As he lived to be very old, he finished a great number of pictures; yet notwithstanding his application and years, the real pictures of Giacomo are not commonly met with. Many of those which are called originals by purchasers as well as dealers, being at best no more than copies by the sons of Bassan, who were far inferior to him; or perhaps by

Bass,
Bassan.

† See *Pelicanus*.

Bassani,
Bassantin.

by some painter of still meaner abilities. But the true pictures of Giacomo always bear a considerable price if they happen to be undamaged. He died in 1592, aged 82.—Francis and Leander, his sons, distinguished themselves in the same art; but inheriting a species of lunacy from their mother, both came to an untimely end.

BASSANI (Giovanni Battista), maestro di cappella of the cathedral church of Bologna about the middle of the last century, was a very voluminous composer of music, having given to the world no fewer than 31 different works. He is equally celebrated both as a composer for the church and for concerts; and was besides a celebrated performer on the violin, and, as it is said, taught Corelli on that instrument. His compositions consist of masses, psalms, motets with instrumental parts, and sonatas for violins: his fifth opera in particular, containing 12 sonatas for two violins and a bass, is much esteemed; it is written in a style wonderfully grave and pathetic, and abounds with evidences of great learning and fine invention. The first and third operas of Corelli are apparently formed after the model of this work. Bassani was one of the first who composed motets for a single voice, with accompaniments of violins; a practice which is liable to objection, as it assimilates church-music too nearly to that of the chamber; and of his solo-motets it must be confessed that they differ in style but little from opera airs and cantatas: two operas of them, viz. the eighth and thirteenth, were printed in London by Pearson above 50 years ago, with the title of *Harmonia Festiva*.

BASSANTIN (James), a Scotch astronomer, son of the Laird of Bassantin in Mers, was born in the reign of James IV. He was educated at the university of Glasgow, travelled through Germany and Italy, and then fixed his abode in the university of Paris, where he taught mathematics with great applause. Having acquired some fortune in this occupation in 1562, he returned to Scotland, where he died in the year 1568. From his writings, he appears to have been no contemptible astronomer, considering the times; but, like most of the mathematicians of that age, he was not a little addicted to judicial astrology. Sir James Melvil, in his Memoirs, says that his brother Sir Robert, when he was exerting his abilities to reconcile the two queens Elizabeth and Mary, met with one Bassantin; a man learned in the high sciences, who told him, "that all his travel would be in vain; for, said he, they will never meet together; and next, there will never be any thing but dissembling and secret hatred for a while, and at length captivity and utter wreck to our queen from England." He added, "that the kingdom of England at length shall fall, of right, to the crown of Scotland: but it shall cost many bloody battles; and the Spaniards shall be helpers, and take a part to themselves for their labour." Sir James Melvil is an author of credit; therefore it is probable that our astrologer ventured to utter his prediction: but, as it proved true only in part, either he misunderstood the stars, or they deceived the astrologer. His works are, 1. *Astronomia Jacobi Bassantini Scoti, opus absolutissimum, &c. ter editum Latine et Gallice*. Genev. 1599, fol. This is the title given it by Tornæsius, who translated it into Latin from the French, in which language it was first published. 2. *Paraphrase de l'Astrolabe, avec un am-*

plification de l'usage de l'Astrolabe. Lyons 1555. Paris 1617, 8vo. 3. *Mathematic. genethliaca*. 4. *Aritmetica*. 5. *Musica secundum Platonem*. 6. *De mathefi in genere*.

Basset.

BASSE, or BASS, a town of the French Netherlands, in the county of Flanders, on the confines of Artois, remarkable on account of the many sieges it has sustained; but its fortifications are now demolished. It is seated on a canal which runs as far as Deule. E. Long. 3. 0. N. Lat. 50. 53.

BASSE Terre, part of the island of St Christopher's, one of the Carribbee islands, formerly occupied by the French, but ceded to Great Britain by the treaty of Utrecht in 1713.

BASSET, or Basette, a game with cards, said to have been invented by a noble Venetian, for which he was banished. It was first introduced in France by Signior Justiniani, ambassador of Venice, in 1674. Severe laws were made against it by Louis XIV. to elude which they disguised basset under the name of *pour & contre*, that is, "for and against," which occasioned new arrets and prohibitions of parliament. The parties concerned in it are, a dealer or banker; his assistant, who supervises the losing cards; and the punter, or any one who plays against the banker.

Besides these, there are other terms used in this game; as, 1. The *fasse* or *face*, which is the first card turned up by the *tailleur* belonging to the pack, by which he gains half the value of the money laid down on every card of that sort by the punters. 2. The *couch*, or first money which every punter puts on each card; each person that plays having a book of 13 several cards before him, on which he may lay his money, more or less, at discretion. 3. The *paroli*; which is, when a punter having won the first stake, and having a mind to pursue his good fortune, crooks the corner of his card, and lets his prize lie, aiming at a *sept et la va*. 4. The *masse*; when having won the first stake, the punter is willing to venture more money on the same card. 5. The *pay*; when the punter having won the first stake, be it a shilling, half-crown, guinea, or whatever he laid down on his card, and not caring to hazard the *paroli*, leaves off, or goes the *pay*; in which case, if the card turn up wrong, he loses nothing, having won the couch before; whereas, if it turn right, he by this adventure wons double the money staked. 6. The *alpieu*; much the same with *paroli*, and used when a couch is won by turning up or crooking the corner of the winning card. 7. *Sept et le va*, the first great chance or prize, when the punter, having won the couch, makes a *paroli*, and goes on to a second chance; so that if his winning card turns up again, it comes to *sept et le va*, which is seven times as much as he laid down on his card. 8. *Quinze et le va* is the next higher prize, when the punter having won the former, is resolved to push his fortune, and lay his money a second time on the same card by crooking another corner; in which case, if it comes up, he wins fifteen times the money he laid down. 9. *Trent et le va* is the next higher prize, when the punter, crooking the fourth corner of his winning card, if it turn up, wins 33 times the money he first staked. 10. *Soixant et le va* is the highest prize, and intitles the winner to 67 times his first money; which, if it were considerable, stands a chance to break the bank:

Basset,
Basseting.

but the bank stands many chances first of breaking the punter. This cannot be won but by the tailleur's dealing the cards over again.

The rules of the game of basset are as follow: 1. The banker holds a pack of 52 cards, and having shuffled them, he turns the whole pack at once, so as to discover the last card; after which he lays down all the cards by couples. 2. The punter has his book of 13 cards in his hand, from the king to the ace; out of these he takes one card, or more, at pleasure, upon which he lays a stake. 3. The punter may, at his choice, either lay down his stake before the pack is turned, or immediately after it is turned, or after any number of couples are down. 4. Supposing the punter to lay down his stake after the pack is turned, and calling 1, 2, 3, 4, 5, &c. the places of those cards which follow the card in view, either immediately after the pack is turned, or after any number of couples are drawn. Then, 5. If the card upon which the punter has laid a stake comes out in any even place, except the first, he wins a stake equal to his own. 6. If the card upon which the punter has laid a stake comes out in any even place, except the second, he loses his stake. 7. If the card of the punter comes out in the first place, he neither wins nor loses, but takes his own stake again. 8. If the card of the punter comes out in the second place, he does not lose his whole stake, but only one half; and this is the case in which the punter is said to be *faced*. 9. When the punter chooses to come in after any number of couples are down, if his card happens to be but once in the pack and is the last of all, there is an exception from the general rule; for though it comes out in an odd place, which should intitle him to win a stake equal to his own, yet he neither wins nor loses from that circumstance, but takes back his own stake.

This game has been the object of mathematical calculations. M. de Moivre solves this problem; to estimate at basset the loss of the punter under any circumstance of cards remaining in the stock when he lays his stake, and of any number of times that his card is repeated in the stock. From this solution he has formed a table showing the several losses of the punter in whatsoever circumstances he may happen to be. From this table it appears, 1. That the fewer the cards are in the stock, the greater is the loss of the punter. 2. That the least loss of the punter, under the same circumstances of cards remaining in the stock, is when his card is but twice in it; the next greater when but three times; still greater when four times; and the greatest when but once. The gain of the banker upon all the money adventured at basset is 15 s. 3 d. *per cent*.

BASSET (Peter), a gentleman of a good family, was chamberlain or gentleman of the privy-chamber to King Henry V. a constant attendant on that brave prince, and an eye-witness of his most glorious actions both at home and abroad; all which he particularly described in a volume intitled, *The Acts of King Henry V.* which remains in MS. in the college of heralds.

BASSETING, in the coal mines, denotes the rise of the vein of coal towards the surface of the earth, till it come within two or three feet of the surface itself. This is also called by the workmen *cropping*; and stands opposed to *dipping*, which is the descent of the vein to

such a depth that it is rarely, if ever, followed to the end.

BASSIA; a genus of the monogynia order, belonging to the dodecandria class of plants; the characters of which are: the calyx is quadriphyllous; the corolla octofid, with the tube inflated; the stamina are 16; and the drupe is quinquespermous. There is but one species, the *longifolia*, a native of Malabar.

BASSO RELIEVO, or BASS-RELIEF; a piece of sculpture, where the figures or images do not protuberate, jet, or stand out, far above the plane on which they are formed.—Whatever figures or representations are thus cut, stamped, or otherwise wrought, so that not the entire body, but only part of it, is raised above the plane, are said to be done in *relief* or *relievo*; and when that work is low, flat, and but little raised, it is called *low relief*. When a piece of sculpture, a coin, or a medal, has its figure raised so as to be well distinguished, it is called *bold*, and we say its *relief is strong*.

BASSOON, a musical instrument of the wind sort, blown with a reed, furnished with 11 holes, and used as a bass in a concert of hautboys, flutes, &c.—To render this instrument more portable, it is divided into two parts, whence it is also called a *fagot*. Its diameter at bottom is nine inches, and its holes are stopped like those of a large flute.

BASSORA, BALSORA, or *Basrah*, a city between Arabia and Persia, situated in the extremity of the deserts of Irak, a little to the west of the Tigris, in about 57° east longitude, and 30° north latitude. It was built by the command of the khalif Omar, in the 15th year of the Hegira, for the sake of carrying on more commodiously an extensive commerce between the Syrians, Arabians, Persians, and Indians. It is at present a very famous emporium of the East; and stands upon a thick stony soil, as the word *basra* imports, about a day and a half's journey from one of the mouths of the Tigris, where it empties itself into the Persian Gulf, denominated likewise from this town the *Bay of Basra*. The circumjacent track is looked upon by the Arabs to be one of the most delightful spots in Asia, and even as one of the most beautiful gardens in the world; however, the hot winds that frequently blow there are very troublesome to travellers, and sometimes overwhelm them with sand driven by the force of these winds out of the neighbouring deserts. The city is inhabited by Jacobites, Nestorians, Jews, Mahometans, and Chaldean Christians, commonly called *Christians of St John*, which last are pretty numerous here.

The Abbé Raynal values the merchandise annually brought to Bassora at L. 525,000: of which the English furnish L. 175,000; the Dutch L. 87,500; and the Moors, Banians, Armenians, and Arabs, furnish the remainder. “The cargoes of these nations (says he) consist of rice; sugar; plain, striped, and flowered muslins from Bengal; spices from Ceylon and the Molucca islands; coarse, white, and blue cottons from Coromandel; cardamum, pepper, sanders-wood, from Malabar; gold and silver stuffs, turbans, shawls, indigo, from Surat; pearls from Baharan, and coffee from Mocha; iron, lead, and woollen cloth, from Europe. Other articles of less consequence are imported from different places. Some of these commodities are shipped on board small Arabian vessels; but the greater part is brought

Bassra,
Bassora.

Bassora, Bastard. brought by European ships, which have the advantage of a considerable freight.

"This merchandise is sold for ready money; and passes through the hands of the Greeks, Jews, and Armenians. The Banians are employed in changing the coin current at Bassora, for that which is of higher value in India.

"The different commodities collected at Bassora are distributed into three channels. One half of them goes to Persia, whither they are conveyed by the caravans; there being no navigable river in the whole empire. The chief consumption is in the northern provinces, which have not been so much ravaged as those of the south. Both of them formerly made their payments in precious stones, which were become common by the plunder of India. They had afterwards recourse to copper utensils, which had been exceedingly multiplied from the great abundance of copper mines. At last they gave gold and silver in exchange, which had been concealed during a long scene of tyranny, and are continually dug out of the bowels of the earth. If they do not allow time for the trees that produce gum, and have been cut to make fresh shoots; if they neglect to multiply the breed of goats which afford such fine wool; and if the silks, which are hardly sufficient to supply the few manufactures remaining in Persia, continue to be so scarce; in a word, if this empire does not rise again from its ashes; the mines will be exhausted, and this source of commerce must be given up."

BASTARD, a natural child, or one begotten and born out of lawful wedlock.

Blackstone's Comment.

The civil and canon laws do not allow a child to remain a bastard, if the parents afterwards intermarry: and herein they differ most materially from our law; which though not so strict as to require that the child shall be *begotten*, yet makes it an indispensable condition that it shall be *born*, after lawful wedlock. And the reason of our law is surely much superior to that of the Roman, if we consider the principal end and design of establishing the contract of marriage, taken in a civil light; abstractedly from any religious view, which has nothing to do with the legitimacy or illegitimacy of the children. The main end and design of marriage, therefore, being to ascertain and fix upon some certain person, to whom the care, the protection, the maintenance, and the education of the children, should belong; this end is undoubtedly better answered by legitimating all issue born after wedlock, than by legitimating all issue of the same parties, even born before wedlock, so as wedlock afterwards ensues: 1. Because of the very great uncertainty there will generally be, in the proof that the issue was really begotten by the same man; whereas, by confining the proof to the birth, and not to the begetting, our law has rendered it perfectly certain, what child is legitimate, and who is to take care of the child. 2. Because by the Roman law a child may be continued a bastard, or made legitimate, at the option of the father and mother, by a marriage *ex post facto*; thereby opening a door to many frauds and partialities, which by our law are prevented. 3. Because by those laws a man may remain a bastard till 40 years of age, and then become legitimate by the subsequent marriage of his parents; whereby the main end of marriage, the protection of infants, is totally frustrated. 4. Because this rule of the Ro-

man law admits of no limitation as to the time, or number of bastards to be so legitimated; but a dozen of them may, 20 years after their birth, by the subsequent marriage of their parents, be admitted to all the privileges of legitimate children. This is plainly a great discouragement to the matrimonial state; to which one main inducement is usually not only the desire of having children, but also the desire of procreating lawful heirs. Whereas our constitution guards against this indecency, and at the same time gives sufficient allowance to the frailties of human nature. For if a child be begotten while the parents are single, and they will endeavour to make an early reparation for the offence, by marrying within a few months after, our law is so indulgent as not to bastardize the child, if it be born, though not begotten, in lawful wedlock; for this is an incident that can happen but once; since all future children will be begotten, as well as born, within the rules of honour and civil society.

From what has been said it appears, that all children born before matrimony are bastards by our law: and so it is of all children born so long after the death of the husband, that, by the usual course of gestation, they could not be begotten by him. But this being a matter of some uncertainty, the law is not exact as to a few days. But if a man dies, and his widow soon after marries again, and a child is born within such a time as that by the course of nature it might have been the child of either husband: in this case, he is said to be more than ordinarily legitimate; for he may, when he arrives to years of discretion, choose which of the fathers he pleases. To prevent this, among other inconveniences, the civil law ordained that no widow should marry *infra annum luctus*; a rule which obtained so early as to the reign of Augustus, if not of Romulus: and the same constitution was probably handed down to our early ancestors from the Romans, during their stay in this island; for we find it established under the Saxon and Danish governments.

As bastards may be born before the coverture or marriage state is begun, or after it is determined, so also children born during wedlock may in some circumstances be bastards. As if the husband be out of the kingdom of England (or as the law loosely phrases it, *extra quatuor maria*) for above nine months, so that no access to his wife can be presumed, her issue during that period shall be bastards. But generally during the coverture, access of the husband shall be presumed, unless the contrary shall be shown; which is such a negative as can only be proved by showing him to be elsewhere; for the general rule is, *presumitur pro legitimatione*. In a divorce *a mensa et thoro*, if the wife breeds children, they are bastards; for the law will presume the husband and wife conformable to the sentence of separation, unless access be proved: but in a voluntary separation by agreement, the law will suppose access, unless the negative be shown. So also, if there is an apparent impossibility of procreation on the part of the husband, as if he be only eight years old, or the like, there the issue of the wife shall be bastard. Likewise, in case of divorce in the spiritual court *a vinculo matrimonii*, all the issue born during the coverture are bastards; because such divorce is always upon some cause that rendered the marriage unlawful and null from the beginning.

Bastard.

As to the *duty* of parents to their bastard children, by our law, it is principally that of maintenance. For though bastards are not looked upon as children to any civil purposes; yet the ties of nature, of which maintenance is one, are not so easily dissolved: and they hold indeed as to many other intentions; as particularly that a man shall not marry his bastard-sister or daughter. The method in which the English law provides maintenance for them is as follows: When a woman is delivered, or declares herself with child, of a bastard, and will by oath before a justice of the peace charge any person having got her with child, the justice shall cause such person to be apprehended, and commit him till he gives security, either to maintain the child, or appear at the next quarter sessions to dispute and try the fact. But if the woman dies, or is married, before delivery, or miscarries, or proves not to have been with child, the person shall be discharged; otherwise the sessions, or two justices out of sessions, upon original application to them, may take order for the keeping of the bastard, by charging the mother or the reputed father with the payment of money or other sustentation for that purpose. And if such putative father, or lewd mother, run away from the parish, the overseers by direction of two justices may seize their rent, goods, and chattels, in order to bring up the said bastard child. Yet such is the humanity of our laws, that no woman can be compulsively questioned concerning the father of her child till one month after her delivery: which indulgence is however very frequently a hardship upon parishes, by giving the parents opportunity to escape.

As to the *rights* and *incapacities* which appertain to a bastard: The former are very few, being only such as he can *acquire*; for he can *inherit* nothing, being looked upon as the son of nobody, and sometimes called *filius nullius*, sometimes *filius populi*. Yet he may gain a surname by reputation, though he has none by inheritance. All other children have their primary settlement in their father's parish; but a bastard in the parish where born, for he hath no father. However, in case of fraud, as if a woman either be sent by order of justices, or comes to beg as a vagrant, to a parish which she does not belong to, and drops her bastard there; the bastard shall, in the first case, be settled in the parish from whence she was illegally removed; or in the latter case, in the mother's own parish, if the mother be apprehended for her vagrancy. Bastards also, born in any licensed hospital for pregnant women, are settled in the parishes to which the mothers belong.—The *incapacity* of a bastard consists principally in this, that he cannot be heir to any one; for being *nullius filius*, he is therefore of kin to nobody, and has no ancestor from whom any inheritable blood can be derived: Therefore, if there be no other claimant upon an inheritance than such illegitimate child, it shall escheat to the lord. And as bastards cannot be heirs themselves, so neither can they have any heirs but those of their own bodies. For as all collateral kindred consists in being derived from the same common ancestor, and as a bastard has no legal ancestors, he can have no collateral kindred; and consequently can have no legal heirs, but such as claim by a lineal descent from himself. And therefore, if a bastard purchases land, and dies seised thereof without issue, and intestate, the land shall escheat to the lord of

the fee. A bastard was also, in strictness, incapable of holy orders; and though that were dispensed with, yet he was utterly disqualified from holding any dignity in the church; but this doctrine seems now obsolete; and in all other respects, there is no distinction between a bastard and another man. And really any other distinction but that of not inheriting, which civil policy renders necessary, would, with regard to the innocent offspring of his parents crimes, be odious, unjust, and cruel to the last degree; and yet the civil law, so boasted of for its equitable decisions, made bastards in some cases incapable even of a gift from their parents. A bastard may, lastly, be made legitimate, and capable of inheriting, by the transcendent power of an act of parliament, and not otherwise: as was done in the case of John of Gaunt's bastard children, by a statute of Richard II.

As to the *punishment* for having bastard children: By the statute 18 Eliz. c. 3. two justices may take order for the punishment of the mother and reputed father: but what that punishment shall be, is not therein ascertained: though the cotemporary exposition was, that a corporeal punishment was intended. By statute 7 Jac. I. c. 4. a specific punishment (*viz.* commitment to the house of correction) is inflicted on the woman only. But in both cases, it seems that the penalty can only be inflicted, if the bastard becomes chargeable to the parish; for otherwise the very maintenance of the child is considered as a degree of punishment. By the last mentioned statute the justices may commit the mother to the house of correction, there to be punished and set on work for one year; and in case of a second offence, till she find sureties never to offend again.

He that gets a bastard in the hundred of Middleton in Kent, forfeits all his goods and chattels to the king*. * *Chamb. Dia.*

If a bastard be got under the umbrage of a certain oak in Knollwood in Staffordshire, belonging to the manor of Terley-castle, no punishment can be inflicted, nor can the lord nor the bishop take cognizance of it†.

It is enacted by statute 21 Jac. I. c. 27. that if any woman be delivered of a child, which if born alive should by law be a bastard; and endeavours privately to conceal its death, by burying the child or the like; the mother so offending shall suffer death, as in the case of murder, unless she can prove by one witness at least that the child was actually born dead. This law, which favours pretty strongly of severity, in making the concealment of the death almost conclusive evidence of the child's being murdered by the mother, is nevertheless to be also met with in the criminal codes of many other nations of Europe; as the Danes, the Swedes, and the French: but it has of late years been usual with us, upon trials for this offence, to require some sort of presumptive evidence that the child was born alive, before the other constrained presumption (that the child, whose death is concealed, was therefore killed by its parent) is admitted to convict the prisoner.

Concerning bastards in Scotland, see LAW, Part III. N° clxxxii. 3, 4. and clxxii. 33.

BASTARD, in respect of artillery, is applied to those pieces which are of an unusual or illegitimate make or pro-

† *Plot. Nat. Hist. Staff.* p. 279.

Bastard
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Bastarnæ.

proportion. These are of two kinds, long and short, according as the defect is on the redundant or defective side. The long bastards again, are either common or uncommon. To the common kind belong the double culverin extraordinary, half culverin extraordinary, quarter culverin extraordinary, falcon extraordinary, &c. The ordinary bastard culverin carries a ball of eight pounds.

BASTARDS are also an appellation given to a kind of faction or troop of banditti who rose in Guienne about the beginning of the fourteenth century, and joining with some English parties, ravaged the country, and set fire to the city of Xaintes.—Mezeray supposes them to have consisted of the natural sons of the nobility of Guienne, who being excluded the right of inheriting from their fathers, put themselves at the head of robbers and plunderers to maintain themselves.

BASTARD Flower-fence. See ADENANTHERA.—The flowers of this plant bruised and steeped in breast-milk are a gentle anodyne; for which purpose they are often given in the West Indies to quiet very young children. The leaves are used instead of senna in Barbadoes and the Leeward Islands. In Jamaica, the plant is called *sena*.

BASTARD hemp. See DATISCA.

BASTARD-Rocket, Dyers-weed, or Wild Woad. See RESEDA.

BASTARD Star-of-Bethlehem. See ALBUCA.

BASTARD-Scarlet is a name given to red dyed with bale-madder, as coming nearest the bow-dye, or new scarlet.

BASTARDY is a defect of birth objected to one born out of wedlock. Eustathius will have bastards among the Greeks to have been in equal favour with legitimate children, as low as the Trojan war; but the course of antiquity seems against him. Potter and others show, that there never was a time when bastardy was not in disgrace.

In the time of William the Conqueror, however, bastardy seems not to have implied any reproach, if we may judge from the circumstance of that monarch himself not scrupling to assume the appellation of bastard. His epistle to Alan count of Bretagne begins, *Ego*

† *Du Cange, Willielmus cognomento bastardus* †.

Gloss. Lat.
T. I. p. 502.

BASTARDY, in relation to its trial in law, is distinguished into general and special. *General* bastardy is a certificate from the bishop of the diocese, to the king's justices, after inquiry made, whether the party is a bastard or not, upon some question of inheritance. *Bastardy special* is a suit commenced in the king's courts, against a person that calls another bastard.

Arms of BASTARDY should be crossed with a bar, fillet, or traverse, from the left to the right. They were not formerly allowed to carry the arms of their father, and therefore they invented arms for themselves; and this is still done by the natural sons of a king.

Right of BASTARDY, Droit de batardise, in the French laws, is a right, in virtue whereof the effects of bastards dying intestate devolve to the king or the lord.

BASTARNÆ, or BASTERNÆ, a people of German original, manners, and language; who extended themselves a great way to the east of the Vistula, the east boundary of Germany, among the Sarmatæ, as far as

the mouth of the Ister and the Euxine; and were divided into several nations.

BASTARNICÆ ALPES, (anc. geog.), mountains extending between Poland, Hungary, and Transylvania, called also the *Carpates*, and now the *Carpathian* mountains.

BASTI (anc. geog.), a town of the province of Bætica in Spain, situated to the west of the Campus Spartarius. Now *Baza* in Granada.

BASTIA, a sea-port town of Albania in Turkey in Europe, over against the island of Corfu, at the mouth of the river Calamu. E. Lon. 10. 35. N. Lat. 39. 40.

BASTIA, the capital of the island of Corsica in the Mediterranean. It has a good harbour; and is seated on the eastern part of the coast, in E. Long. 9. 42. N. Lat. 42. 35.

BASTILE, denotes a small antique castle, fortified with turrets. Such is the bastille of Paris, which seems the only castle that has retained the name: it was begun to be built in 1369 by order of Charles V. and was finished in 1383 under the reign of his successor.—Its chief use is for the custody of state-prisoners; or, more properly speaking, for the clandestine purposes of unfeeling despotism.

The lieutenant-general of the police of Paris is the sub-delegate of the ministry for the department of the Bastille. He has under him a titular commissary, who is called the commissary of the Bastille. He has a fixed salary for drawing up what are called instructions, but he does not this exclusively. He has no inspection nor function but in cases where he receives orders; the reason of which is, that all that is done in this castle is arbitrary.

Every prisoner on coming to the Bastille has an inventory made of every thing about him. His trunks, cloaths, linens, and pockets are searched, to discover whether there be any papers in them relative to the matter for which he is apprehended. It is not usual to search persons of a certain rank; but they are asked for their knives, razors, scissors, watches, canes, jewels, and money. After this examination, the prisoner is conducted into an apartment, where he is locked up within three doors. They who have no servants make their own bed and fire. The hour of dining is eleven, and of supping six.

At the beginning of their confinement, they have neither books, ink or paper; they go neither to mass, nor on the walks; they are not allowed to write to any one, not even to the lieutenant of the police, on whom all depends, and of whom permission must first be asked by means of the major, who seldom refuses. At first they go to mass only every other Sunday. When a person has obtained leave to write to the lieutenant of the police, he may ask his permission to write to his family, and to receive their answers; to have with him his servant or an attendant, &c. which requests are either granted or refused according to circumstances. Nothing can be obtained but through this channel.

The officers of the staff take the charge of conveying the letters of the prisoners to the police. They are sent regularly at noon and at night: but if they desire it, their letters are sent at any hour by expresses, who are paid out

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Bastile.

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out of the money of those who are confined. The answers are always addressed to the major, who communicates them to the prisoner. If no notice is taken of any request contained in the letter of the prisoner, it is a refusal. The attendants whom they appoint for those who are not allowed their own servants, or who have none of their own, are commonly invalid soldiers. These people lie near the prisoners, and wait upon them. A person ought always to be upon his guard with these men, as well as with the turnkeys; for all his words are noticed, and carried to the officers, who report them to the police: it is thus they study the characters of the prisoners. In this castle, all is mystery, trick, artifice, snare, and treachery. The officers, attendants, turnkeys, and valets, often attempt to draw a man on to speak against the government, and then inform of all.

Sometimes a prisoner obtains permission of having books, his watch, knife, and razors, and even paper and ink. He may ask to see the lieutenant of the police when he comes to the Bastile. This officer commonly causes prisoners to be brought down some days after their arrival. Sometimes he goes to visit them in their chambers; especially the ladies.

When the lieutenant of the police sees a prisoner, the conversation turns upon the cause of his confinement. He sometimes asks for written and signed declarations. In general, as much circumspection should be used in these conferences as in the examination itself, since nothing that a person may have said or written is forgotten.

When a prisoner wants to transmit any thing to the lieutenant of the police, it is always by means of the major. Notes may be sent to this officer by the turnkeys. A person is never anticipated in any thing—he must ask for every thing; even for permission to be shaved. This office is performed by the surgeon; who also furnishes sick or indisposed prisoners with sugar, coffee, tea, chocolate, confections, and the necessary remedies.

The time for walking is an hour a day; sometimes an hour in the morning and an hour in the evening, in the great court.

A prisoner may be interrogated a few days after his entrance into the Bastile, but frequently this is not done till after some weeks. Sometimes he is previously informed of the day when this is to be done; often he is only acquainted with it the moment he is brought down to the council-chamber. This commission of interrogatory is executed by the lieutenant of the police, a counsellor of state, a master of requests, a counsellor or a commissioner of the Châtelet. When the lieutenant of the police does not himself interrogate, he usually comes at the end of the examination.

These commissioners are purely passive beings. Frequently they attempt to frighten a prisoner; they lay snares for him, and employ the meanest artifices to get a confession from him. They pretend proofs, exhibit papers without suffering him to read them; asserting that they are instruments of unavoidable conviction. Their interrogatories are always vague. They turn not only on the prisoner's words and actions, but on his most secret thoughts, and on the discourse and conduct of persons of his acquaintance, whom it is wished to bring into question.

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The examiners tell a prisoner that his life is at stake; that this day his fate depends upon himself; that if he will make a fair declaration, they are authorized to promise him a speedy release; but if he refuses to confess, he will be given up to a special commission: that they are in possession of decisive documents, of authentic proofs, more than sufficient to ruin him; that his accomplices have discovered all; that the government has unknown resources, of which he can have no suspicion. They fatigue prisoners by varied and infinitely multiplied interrogatories. According to the persons, they employ promises, caresses, and menaces. Sometimes they use insults, and treat the unhappy sufferers with an insolence that fills up the measure of that tyranny of which they are the base instruments.

If the prisoner makes the required confession, the commissioners then tell him that they have no precise authority for his enlargement, but that they have every reason to expect it; that they are going to solicit it, &c. The prisoner's confessions, far from bettering his condition, give occasion to new interrogatories, often lengthen his confinement, draw in the persons with whom he has had connections, and expose himself to new vexations.

Although there are rules for all occasions, yet every thing is subject to exceptions arising from influence, recommendations, protection, intrigue, &c. because the first principle in this place is arbitrary will. Very frequently, persons confined on the same account are treated very differently, according as their recommendations are more or less considerable.

There is a library, founded by a foreign prisoner who died in the Bastile in the beginning of the present century. Some prisoners obtain leave to go to it; others, to have the books carried to their chambers.

The falsest things are told the prisoners with an air of sincerity and concern. "It is very unfortunate that the king has been prejudiced against you. His majesty cannot hear your name mentioned without being irritated. The affair for which you have lost your liberty is only a pretext—they had designs against you before—you have powerful enemies." These discourses are the etiquette of the place.

It would be in vain for a prisoner to ask leave to write to the king—he can never obtain it.

The perpetual and most insupportable torment of this cruel and odious inquisition, are vague, indeterminate, false, or equivocal promises, inexhaustible and constantly deceitful hopes of a speedy release, exhortations to patience, and blind conjectures, of which the lieutenant of the police and officers are very lavish.

To cover the odium of the barbarities exercised here, and slacken the zeal of relations or patrons, the most absurd and contradictory slanders against a prisoner are frequently published. The true causes of imprisonment, and real obstacles to release, are concealed. These resources, which are infinitely varied, are inexhaustible.

When a prisoner who is known and protected has entirely lost his health, and his life is thought in danger, he is always sent out. The ministry do not choose that persons well known should die in the Bastile. If a prisoner does die there, he is interred in the parish of St Paul, under the name of a domestic; and this falsity

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falsity is written in the register of deaths, in order to deceive posterity. There is another register in which the true names of the deceased are entered; but it is not without great difficulty that extracts can be procured from it. The commissary of the Bastile must first be informed of the use the family intends to make of the extract.

In 1674 the baggage of Louis chevalier de Rohan, grand huntsman of France, having been taken and rummaged in a skirmish, some letters were found which caused a suspicion that he had treated with the English for the surrender of Havre de Grace. He was arrested and put into the Bastile. The Sieur de la Tuanderie, his agent, concealed himself. The proof was not sufficient. A commission was named to proceed against the accused for treason. La Tuanderie was discovered at Rouen: an attempt was made to arrest him; but he fired on the assailants, and obliged them to kill him on the spot. Persons attached to the chevalier de Rohan went every evening round the Bastile, crying through a speaking trumpet, "La Tuanderie is dead, and has said nothing;" but the chevalier did not hear them. The commissioners, not being able to get any thing from him, told him, "that the king knew all, that they had proofs, but only wished for his own confession, and that they were authorised to promise him pardon if he would declare the truth." The chevalier, too credulous, confessed the whole. Then the perfidious commissioners changed their language. They said, "that with respect to the pardon, they could not answer for it; but that they had hopes of obtaining it, and would go and solicit it." This they troubled themselves little about, and condemned the criminal to lose his head. He was conducted on a platform to the scaffold, by means of a gallery raised to the height of the window of the armoury in the arsenal, which looks towards the little square at the end of the *Rue des Tournelles*. He was beheaded on November 27. 1674.

The Jesuits of the college of Clermont, in the *Rue St Jacques* Paris, having this same year (1674) invited the king (Louis XIV.) to honour with his presence a tragedy to be performed by their scholars, that prince accepted the invitation. These able courtiers took care to insert in the piece several strokes of flattery, with which the monarch, greedy of such incense, was greatly pleased. When the rector of the college was conducting the king home, a nobleman in the train applauded the success of the tragedy. Louis said, "Do you wonder at it? *this is my college.*" The Jesuits did not lose a word of this: The very same night they got engraved in large golden letters on black marble, *Collegium Lodovici Magni*, instead of the former inscription which was placed beneath the name of Jesus on the principal gate of the college (*Collegium Claramontanum Societatis Jesus*); and in the morning the new inscription was put up in place of the old one. A young scholar of quality, aged 13, who was witness to the zeal of the reverend fathers, made the two following verses, which he posted up at night on the college gate:

*Abstulit hinc Jesum, posuitque insignia regis
Impia gens: alium non colit illa Deum.*

The Jesuits did not fail to cry out sacrilege: the
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Bastile.

young author was discovered, taken up, and put into the Bastile. The implacable society caused him, as a matter of *favour*, to be condemned to perpetual imprisonment; and he was transferred to the citadel of the isle Sainte Marguerite. Several years after, he was brought back to the Bastile. In 1705 he had been a prisoner 31 years. Having become heir to all his family, who possessed great property, the Jesuit Riquet, then confessor of the Bastile, remonstrated to his brethren on the necessity of restoring the prisoner to liberty. The golden shower which forced the tower of Danae had the same effect on the castle of the Bastile. The Jesuits made a merit with the prisoner of the protection they granted him; and this man of rank, whose family would have become extinct without the aid of the society, did not fail to give them extensive proofs of his gratitude.

Nowhere else on earth, perhaps, has human misery, by human means, been rendered so lasting, so complete, or so remediless. This the following case may suffice to evince; the particulars of which are translated from that elegant and energetic writer M. Mercier. The heinous offence which merited an imprisonment surpassing torture and rendering death a blessing, though for obvious reasons not specified by our author, is known from other sources to have consisted in some unguarded expressions implying disrespect concerning the late Gallic monarch Louis XV.

Upon the accession of Louis XVI. to the throne, the ministers now in office, and moved by humanity, begun their administration with an act of clemency and justice; they inspected the registers of the Bastile, and set many prisoners at liberty. Among those there was an old man who had groaned in confinement for 47 years between four thick and cold stone-walls. Hardened by adversity, which strengthens both the mind and the constitution, when they are not overpowered by it, he had resisted the horrors of his long imprisonment with an invincible and manly spirit. His locks white, thin, and scattered, had almost acquired the rigidity of iron; whilst his body, environed for so long a time by a coffin of stone, had borrowed from it a firm and compact habit. The narrow door of his tomb, turning upon its grating hinges, opened not as usual by halves; and an unknown voice announced his liberty, and bade him depart. Believing this to be a dream, he hesitated; but at length rose up and walked forth with trembling steps, amazed at the space he traversed: The stairs of the prison, the halls, the court, seemed to him vast, immense, and almost without bounds. He stopped from time to time, and gazed around like a bewildered traveller: His vision was with difficulty reconciled to the clear light of day: He contemplated the heavens as a new object: His eyes remained fixed, and he could not even weep. Stupified with the newly acquired power of changing his position, his limbs, like his tongue, refused, in spite of his efforts, to perform their office; at length he got through the formidable gate.

When he felt the motion of the carriage prepared to transport him to his former habitation, he screamed out, and uttered some inarticulate sounds; and as he could not bear this new movement, he was obliged to descend. Supported by a benevolent arm, he sought out the street where he had formerly resided: he found
I it,

Bastile,
Bastimen-
tos

it, but no trace of his house remained; one of the public edifices occupied the spot where it had stood. He now saw nothing that brought to his recollection, either that particular quarter, the city itself, or the objects with which he had formerly been acquainted. The houses of his nearest neighbours, which were fresh in his memory, had assumed a new appearance. In vain were his looks directed to all the objects around him; he could discover nothing of which he had the smallest remembrance. Terrified, he stopped and fetched a deep sigh. To him, what did it import that the city was peopled with living creatures? None of them were alive to him; he was unknown to all the world, and he knew nobody: And whilst he wept, he regretted his dungeon.

At the name of the Bastile, which he often pronounced and even claimed as an asylum, and the sight of his clothes that marked a former age, the crowd gathered round him: curiosity, blended with pity, excited their attention. The most aged asked him many questions, but had no remembrance of the circumstances he recapitulated. At length accident brought in his way an ancient domestic, now a superannuated porter, who, confined to his lodge for 15 years, had barely sufficient strength to open the gate:—Even he did not know the master he had served; but informed him that grief and misfortune had brought his wife to the grave 30 years before, that his children were gone abroad to distant climes, and that of all his relations and friends none now remained. This recital was made with the indifference which people discover for events long passed, and almost forgot. The miserable man groaned, and groaned alone. The crowd around, offering only unknown features to his view, made him feel the excess of his calamities even more than he would have done in the dreadful solitude that he had left.

Overcome with sorrow, he presented himself before the minister to whose humanity he owed that liberty which was now a burden to him. Bowing down, he said, "Restore me again to that prison from which you have taken me: I cannot survive the loss of my nearest relations; of my friends; and, in one word, of a whole generation: Is it possible in the same moment to be informed of this universal destruction, and not to wish for death? This general mortality, which to the rest of mankind comes slowly and by degrees, has to me been instantaneous, the operation of a moment. Whilst secluded from society, I lived with myself only; but here I neither can live with myself nor with this new race, to whom my anguish and despair appear only as a dream. There is nothing terrible in dying; but it is dreadful indeed to be the last." The minister was melted; he caused the old domestic to attend this unfortunate person, as only he could talk to him of his family. This discourse was the single consolation that he received: for he shunned all intercourse with a new race, born since he had been exiled from the world; and he passed his time in the midst of Paris in the same solitude as he had done whilst confined in a dungeon for almost half a century. But the chagrin and mortification of meeting no person who could say to him, We were formerly known to one another, soon put an end to his existence.

BASTIMENTOS, the name of some small islands

near Terra Firma in South America, at the mouth of Bastinado the bay of Nombre de Dios.

BASTINADO. See BASTONADO.

BASTION, in the modern fortification, a huge mass of earth, faced usually with sods, sometimes with brick, and rarely with stone, standing out from a rampart whereof it is a principal part, and is what, in the ancient fortification, was called a *bulwark*.

Solid BASTIONS, are those that have the void space within them filled up entirely, and raised of an equal height with the rampart.

Void and Hollow BASTIONS, are those that are only surrounded with a rampart and parapet, having the space within void and empty, where the ground is so low, that, if the rampart be taken, no retrenchment can be made in the centre, but what will lie under the fire of the besieged.

Flat BASTION, is a bastion built in the middle of the curtain, when it is too long to be defended by the bastion at its extremes.

Cut BASTION, is that whose point is cut off, and instead thereof has a re-entering angle, or an angle inwards, with two points outwards; and is used either when without such a contrivance the angle would be too acute, or when water or some other impediment hinders the carrying on the bastion to its full extent.

Composed BASTION, is when two sides of the interior polygon are very unequal, which makes the gorges also unequal.

Deformed BASTION, is when the irregularity of the lines and angles makes the bastion out of shape; as when it wants one of its demigorges, one side of the interior polygon being too short.

Demi BASTION, is composed of one face only, and but one flank, and a demigorge.

Double BASTION, is that which is raised on the plane of another bastion.

Regular BASTION, is that which has its true proportion of faces, flanks, and gorges.

BASTION of France, a fortress on the coast of Barbary, belonging to the French.

BASTITANI (anc. geog.) a people of the province of Bætica in Spain. See BÆTICA.

BASTOIGNE, a small town of the Netherlands, in the duchy of Luxemburgh. E. Long. 6. o. N. Lat. 50. 10.

BASTON, in law, one of the servants to the warden of the Fleet prison, who attended the king's courts with a red staff, for taking into custody such as are committed by the court. He also attends on such prisoners as are permitted to go at large by licence.

BASTON, or *Batoon*, in architecture, a moulding in the base of a column, called also a *tore*. See Plate XXXVIII. fig. 3.

BASTON, *Baton*, or *Batune*. This word is French, and signifies a staff or cudgel: it should be spelt *Bâton*; but is, by most English writers, corruptly spelt as above. It is only borne in English coats of arms, as a badge of illegitimacy; but French heralds introduce it in arms as a difference, or mark of consanguinity.

BASTON (Robert), a Carmelite monk, afterwards prior of the convent of that order at Scarborough, and also poet laureat and public orator at Oxford, flourished in the fourteenth century. King Edward

Bastion.

Bastonado ward I. in his expedition into Scotland in 1304, took Robert Baston with him, in order to celebrate his victories over the Scots; but our poet being taken prisoner, was obliged to change his note, and sing the successes of Robert Bruce. He wrote several books in Latin, on the Wars of Scotland, the Luxury of Priests, Synodical Sermons, &c.; and also a volume of tragedies and comedies, in English. He died about the year 1310.

BASTONADO, BASTONADE, the punishment of beating or drubbing a criminal with a stick. The word is formed of the French *baston*, "a stick" or "staff." The bastonade is a punishment used both among the ancient Greeks, Romans, and Jews, and still obtains among the Turks. The Romans called it *fustigatio*, *fustium admonitio*, or *fustibus cedi*; which differed from the *flagellatio*, as the former was done with a stick, the latter with a rod or scourge. The fustigation was a lighter punishment, and inflicted on freemen; the flagellation a severer, and reserved for slaves. It was also called *tymponum*, because the patient here was beat with sticks like a drum.—The punishment is much in use in the east to this day. The method there practised is thus: the criminal being laid on his belly, his feet are raised, and tied to a stake, held fast by officers for the purpose; in which posture he is beaten by a cudgel on the soles of his feet, back, chin, &c. to the number of 100 or more blows.

BASTWICK (Dr John), born at Writtle in Essex, in 1593; practised physic at Colchester; but being a man of warm imagination, and a good Latin scholar, applied himself to writing books against popery. About the year 1633, he printed in Holland a Latin treatise intitled, *Elenchus religionis Papisticae*, with *Flagellum pontificis et episcoporum Latialium*, in which the English prelates thinking themselves also aimed at, he was fined L. 1000 in the high commission court, excommunicated, prohibited practising physic, his books ordered to be burnt, and himself to remain in prison until he made a recantation. Instead of recanting, he wrote in prison, *Apologeticus ad praefules Anglicanos*; and another book called *The Litany*; wherein he severely exclaimed against the proceedings of that court, and taxed the bishops with an inclination towards popery. Prynne and Burton coming under the lash of the star-chamber court at the same time, they were all censured as scandalous seditious persons, condemned to a fine of L. 5000 each, to be pilloried, to lose their ears, and to perpetual imprisonment in three remote parts of the kingdom. The parliament in 1640 reversed these proceedings; and ordered Dr Bastwick a reparation of L. 5000 out of the estates of the commissioners and lords who had prosecuted him, which the ensuing confusions prevented his receiving: however, his wife had, in 1644, an allowance ordered for her and her husband's maintenance. What became of him afterward is not known.

BAT, in zoology. See **VESPERTILIO**.

BAT-Fowling, a method of catching birds in the night, by lighting some straw or torches near the place where they are at roost; for upon beating them up, they fly to the flame, where, being amazed, they are easily caught in nets, or beat down with bushes fixed to the end of poles, &c.

BAT, *Bate*, or *Batz*, a small copper coin, mixed with a little silver, current in several cities of Germany: it is worth four crutzers. It is also a coin in Switzerland, current at five livres, or 100 sols, French money.

BATABLE, or DEBATABLE, GROUND, that land which lay between Scotland and England, when the kingdoms were distinct, to which both nations pretended a right.

BATACALA, a small kingdom on the coast of Malabar in the East Indies. It had a very large town of the same name; but there is nothing now left, except 11 or 12 small pagods, covered with copper and stone. The country produces a good deal of pepper: The English formerly had a factory here; but were all massacred by the natives, because one of their bull-dogs had killed a consecrated cow.

BATACALA, a fortified town and castle on the east coast of the island of Ceylon in the East Indies. The Dutch drove away the Portuguese, and possessed themselves of part of the adjacent country. E. Long. 18. 3. N. Lat. 7. 55.

BATANISTS, or BATENITES. See **BATENITES**.

BATASEK, a town of lower Hungary, seated on the Danube, in E. Long. 19. 50. N. Lat. 46. 30.

BATAVA (*Castra* understood), a citadel of Vindelicia, so called from the Cohors Batava, in garrison under the commander in Rhætia: now *Passau*; being first called *Batau*, from the Batavi; then *Bassau*, and *Passau*; situated in Bavaria at the confluence of the Danube, Inn, and Ills. See **PASSA**.

BATAVIA, the capital of the Dutch settlements in the East Indies; a city of the kingdom of Bantam in the island of Java. See **JAVA**.

BATAVORUM INSULA, the island of the Batavians, (anc. geog.). Of this island Tacitus gives the following description. "The Rhine flowing in one channel, or only broken by small islands, is divided at its entering Batavia, as it were into two rivers. One continues its course through Germany, retaining the same name, and violent current, till it falls into the ocean. The other washing the coast of Gaul, with a broader and more gentle stream, is called by the inhabitants *Vahalis*; which name it soon changes for that of *Mosa*, by the immense mouth of which river it discharges itself into the same ocean." According to Tacitus, therefore, the island of the Batavians was bounded by the ocean, the Rhine, and the Vahalis, now the *Wale*. Cæsar extends it to the Mosa, or *Meuse*; but Pliny agrees with Tacitus. However, this island was of greater extent in Tacitus's time than in Cæsar's; Drusus, the father of Germanicus, having by a new canal conveyed the waters of the Rhine into the ocean a considerable way north of the former mouth of that river. The Batavi were a branch of the Catti, who in a domestic sedition, being expelled their country, occupied the extremity of the coast of Gaul, at that time uninhabited, together with this island situated among shoals. Their name *Batavi* they carried with them from Germany; there being some towns in the territory of the Catti called *Battenberg* and *Battenhausen*. The bravery of the Batavi, especially the horse, procured them not only great honour from the Romans, being called their *brothers* and *friends*; but

Batavorum an exemption from taxes, being obliged only to furnish men and arms. The modern name of this island is *Betu*, or *Betaw*.

BATAVORUM Oppidum (anc. geog.), a town in the island of the Batavi, mentioned by Tacitus, without any particular name; which has given rise to several fables about it, some supposing it to be *Nimeguen*, but Cluverius, *Batavadrurum* or *Batemburg*, both without the island; which situation renders both these places inadmissible, since Tacitus places this nameless town within the island.

BATCHELOR. See **BACHELOR**.

BATE (George), an eminent physician, born at Maid's Morton, near Buckingham, in the year 1608. In 1629 he obtained a licence, and for some years practised in and about Oxford: his practice was chiefly amongst the puritans, who at that time considered him as one of their party. In 1637, he took his degree of doctor in physic, and became very eminent in his profession, so that when king Charles kept his court at Oxford, he was his principal physician. When the king's affairs declined, Dr Bate removed to London, where he accommodated himself so well to the times, that he became physician to the Charter-house, fellow of the college of physicians, and afterwards principal physician to Oliver Cromwell. Upon the restoration, he got into favour with the royal party, was made principal physician to the king, and fellow of the Royal Society; and this, we are told, was owing to a report raised on purpose by his friends, according to Mr Wood, that he gave the protector a dose which hastened his death. Dr Bate wrote in Latin an account of the late commotions in England, and some other pieces. He died at his house in Hatton-garden, and was buried at Kingston upon Thames in Surry.—There was another George Bate who wrote a work intitled, "The Lives, Actions, and Execution, of the prime Actors and principal Contrivers of that horrid Murder of our late pious and sacred King Charles I."

BATENITES, a sect of apostates from Mahometanism dispersed through the East, who professed the same abominable practices with the Ismaelians and Karmatians. The word properly signifies *esoteric*, or people of inward or hidden light.

BATES (William), D. D. an eminent presbyterian divine, born in November 1625. He was admitted in Emanuel college, Cambridge, and from thence removed to King's college in 1644. He was one of the commissioners, at the conference in the Savoy, for reviewing the public liturgy, and was concerned in drawing up the exceptions against the common Prayer: however, soon after the restoration, he was appointed chaplain to king Charles II. and became minister of St Dunstan's in the west, but was deprived of that benefice for nonconformity. Dr Bates bore a good and amiable character; and was honoured with the friendship of the lord keeper Bridgman, the lord chancellor Finch, the earl of Nottingham, and archbishop Tillotson. He was offered, at the restoration, the deanery of Litchfield; which he refused. He published *Select Lives* of illustrious and pious persons, in Latin; and since his death all his works, except his *Select Lives*, have been printed in one volume in folio. He died in July 14. 1699, in the 74th year of his age.

BATH, a city of Somersetshire in England, seated

in W. Long. 2. 30. N. Lat. 51. 27. All the different names that this city has borne in different ages and languages have been taken from its medicinal waters, as the *udata digna*, or "hot waters," of Ptolemy; the *Aque Solis*, or "waters of the sun," of Antoninus; the *Caer Baden*, and *Caer Ennant*, i. e. "the city of baths," and "the city of ointment," of the Britons; and the *Ackmanchefer*, i. e. "the city of valetudinarians," of the Saxons. The baths consist of the King's-bath, the Queen's-bath, the Cross-bath, the Hot-bath, the Leper's-bath, and the duke of Kingston's-bath. This place was of old a resort only for cripples and diseased persons; but now it is more frequented by the sound for pleasure than by the sick for health. The waters are very pleasant to the taste; and impregnated with a vitriolic principle, yielding, upon evaporation, a little neutral salt, and a calcarious earth and iron. They are very efficacious in strengthening the bowels and stomach, bracing the relaxed fibres, and invigorating the circulation. In bilious complaints they are counted specific; and prove serviceable in most nervous, paralytic, rheumatic, and gouty, complaints. At the King's bath is a handsome pump-room, where the gentlemen and ladies go in a morning to drink the waters; and there is a band of music that plays all the time. In the Cross-bath is a monument of marble, representing the descent of the Holy Ghost attended by angels, erected by the earl of Melfort (who was secretary of state for Scotland) when king James II. met his queen here. The King's-bath is a large basin of 65 feet 10 inches by 40 feet 10 inches, containing 346 tuns 2 hogheads and 36 gallons of water when filled to its usual height. In the middle is a wooden building with niches and seats for the accommodation of the bathers. There are also iron rings all round for them to hold by; and guides, both male and female, to attend them in the bath. The person intending to bathe puts on, at his own lodgings, a bathing dress of brown canvas hired for the purpose; and is carried in a close chair, of a particular make, to one of the slips which open into the bath. There he descends by steps into the water, where he is attended by a guide. Having staid his staid time in the bath, he ascends again into the slip, where he puts off his bathing-dress, and being wrapt up in blankets, is carried home to bed, where he lies for some time to encourage perspiration. The King's-bath is overlooked by the company in the pump-room; and adjoining to it are places furnished with pumps to pour the hot streams on any particular part of the body. The Queen's-bath communicates with the King's, from which it is filled; therefore the water of it is not so hot, being at a greater distance from the source. As the heat is here more moderate, the bathers descend first into the Queen's-bath, and advance gradually to the centre of the other. In the year 1755, the abbey-house, or priory, belonging to the duke of Kingston, was taken down, in order to erect a more commodious pile of building; and in digging for the foundation, the workmen discovered, about twenty feet below the surface of the earth, the remains of Roman baths and sudatories constructed upon an elegant plan, with floors suspended on pillars, and surrounded with tubulated bricks, for the conveyance of heat and vapour. These were supplied by a spring of hot water, of the same properties and temperature with those of

Bath.

the

Bath.

the King's-bath; and the sewer was found still entire, that conveyed the waste water into the river. The duke, having cleared the spring and the sewer, has erected several convenient baths and sudatories on the spot, where invalids may be accommodated at all hours, by night as well as by day. The two seasons are the spring and fall; but those who take the waters purely for their health do not regard the seasons, but drink them all the year round. There are a number of genteel sedan chairs, which carry people to any distance, not exceeding half a mile, for sixpence. The company assemble in the afternoons alternately, at two stately rooms, to converse together or play at cards. At a very pretty new theatre near the parades, plays are acted every other night; and there are balls twice a week; for which and the rooms, and books at the libraries, the gentry generally subscribe. The city is surrounded with hills on all sides, except a little opening to the east and west, through which the Avon runs. This river, which has been made navigable to Bristol by act of parliament, washes the city on the east and south sides, and there is an elegant bridge over it. This city hath formerly had a slight wall, of which some part still remains, as well as one or two of its gates; but almost all the new buildings, and much the greatest and finest part of the city, is without the walls, particularly the fine square called *Queen's-square*, in the middle of which is a small garden, with gravel walks, and an obelisk in the centre. But the greatest ornament at Bath is the circus: it is of a circular form, consisting of houses built on an uniform plan, with three openings at equal distances to the south, east, and west, leading into as many streets. The fronts of the houses, which are all three stories high, are adorned with three rows of columns in pairs, of the Doric, Ionic, and Corinthian orders, the frize embellished with sculpture. The whole has an air of magnificence, which cannot fail to strike the most indifferent spectator. In the centre of the area is a reservoir, or basin, filled by two or three springs rising in the neighbouring hills; whence the streets in this district are supplied with water. On the south side of the town are the north and south parades, two noble walks, paved with hewn stone, raised upon arches, facing each an elegant row of houses on one side, and having a stone balustrade on the other. These, with the two streets that join them, were planned and executed by one Mr Wood, an able architect, who likewise built the square and projected the circus. The two public rooms stand betwixt the north parade and Orangegrove; which last is a square planted with trees, having in the middle a stone obelisk, inscribed in Latin to the late prince of Orange, who recovered his health in consequence of drinking the Bath waters, and gave his name to this part of the town. Several new streets and rows have of late years been built on the north side of Bath, in the neighbourhood of the square, such as Gay-street, Milford-street, Edgar-row, Harlequin-row, Bladud's-buildings, King's-mead-street, and Brock-street. Their advantages for building here are very great, having excellent free-stone, limestone, and slate, in the neighbourhood. One sort of their lime is as white as snow. The guild-hall of Bath stands in the market-place, and is said to be built on a plan of Inigo Jones, which, however, exhibits nothing worthy of that great architect: besides, one end of it has been

rebuilt in a different style. The hall is ornamented with some portraits of the late prince of Wales and other remarkable personages: but the greatest curiosity of the place is a Minerva's head in bronze, a real antique, dug up in Stall-street, in the year 1725. Bath boasts a noble infirmary, or general hospital, for the reception of the sick and lame from all parts of the three kingdoms. It extends 100 feet in front and 90 in depth, being capable of receiving 150 patients. Here was anciently a monastery, of which the present cathedral was the church. It is a venerable pile; the principal front of which is adorned with angels ascending and descending. There are three other churches in Bath, and several chapels and meeting-houses. Besides the infirmary, there are several other hospitals, almshouses, and charity-schools. The corporation consists of a mayor; eight aldermen, of whom two are justices of the peace; and 24 common-council men. The city is extremely well provided with stage-coaches, post-coaches, chaises, machines, and waggons. Bath is the general hospital of the nation, and a great number of invalids find benefit from the waters: but as the city lies in a bottom surrounded by very high hills, the air is constantly surcharged with damps; and indeed this place is more subject to rain than any other part in England. The markets are remarkably well supplied with provisions of all kinds at reasonable rates, particularly fish and poultry. They also afford excellent mutton fed upon Lansdown, one of the highest hills that overlook the city. This down, remarkable for its pure air, extends about three miles; and at the extremity of it there is a stone monument, with an inscription, erected to the memory of Sir Beville Granville, who was here killed in a battle which he fought with the parliament's army in the reign of Charles I. Bath sends two members to parliament. The earldom of Bath was bestowed on William Pultney in the end of Sir Robert Walpole's administration as a reward for his patriotism, but is now extinct for want of heirs-male.

Bath is joined with Wells to form a bishopric, called the diocese of Bath and Wells. The bishop's seat is at Wells, whose cathedral church was built by Ina king of the West Saxons in 704, and by him dedicated to St Andrew. Several other of the West Saxons kings endowed it, and was erected into a bishopric in 905, during the reign of king Edward the Elder. The present church was begun by Robert the 18th bishop of this see, and completed by his immediate successor. John de Villula, the 16th bishop, having purchased the city of Bath for 500 merks of king Henry I. transferred his seat to that city in 1088. From this, disputes arose between the monks of Bath and the canons of Wells, about the election of a bishop; but they were at last compromised by Robert the 18th bishop, who decreed, that from henceforward the bishop should be styled from both places, and that the precedency should be given to Bath; that in the vacancy of the see, the bishop should be elected by a certain number of delegates from both churches; and that he should be installed in them both; both of them to constitute the bishop's chapter; and all his grants and patents to be confirmed in both. So it stood till the Reformation. But in the 35th of king Henry VIII. an act of parliament passed for the dean and chapter of Wells to make one sole chapter for the bishop. This diocese hath yielded to the church of Rome one cardinal, and

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to the civil state of England six lord chancellors, five lord treasurers, one lord privy seal, one lord president of Wales, and principal secretary of state. The diocese contains the whole county of Somerset, except a few churches in the city of Bristol; the number of parishes amounting to 388, and the churches and chapels to 503. Of the parishes 160 are impropriate. It is valued in the king's books at L. 535 : 1 : 3, and computed to be worth annually L. 2200. The clergy's tenth is L. 353 : 18 : 0½. To the cathedral belong a bishop, a dean, three archdeacons, a chancellor, a treasurer, a sub-dean, fifty-nine prebendaries, four priest-vicars, eight lay vicars, an organist, six choristers, and other officers.

Knights of the Bath, a military order in England, concerning the origin of which antiquaries differ in their accounts. The most probable deduction seems to be the following.

The knighthood of the bath is supposed to have been practised by the ancient Franks, the inhabitants of Lower Germany, with whom it is highly probable the Saxons, who invaded England, had the same common descent, and, with other customs, upon their settling here, introduced the same method of knighthood. These ancient Franks, when they conferred knighthood, observed, amongst other solemn rites, bathing before they performed their vigils; which custom continues to be practised in England: they were from thence denominated *Knights of the Bath*.

In the reign of Henry IV. there was a degree of knighthood specified under the express appellation of *the Bath*. That king, on the day of his coronation in the Tower of London, conferred the same upon 46 esquires, who had watched all the night before, and had bathed themselves. From that time it was customary with our kings to confer this dignity preceding their coronations, the coronations of their queens, the birth and marriage of the royal issue, and their first advancement to honours, upon their designed expeditions against their foreign enemies, upon installations of knights of the garter, and when some grand anniversary festivals were celebrated. The last knights of the Bath so made were at the coronation of King Charles II. in 1661; after which the order was neglected until the year 1725, when George I. was pleased to revive it, and to order a book of statutes for the government of the order. By this the number of knights is fixed to 38, viz. the sovereign and 37 knights companions.

The apparel of a knight of the Bath is a red surcoat, lined and edged with white, girded about with a white girdle, without any ornament thereon; the mantle is of the same colour and lining, made fast about the neck with a lace of white silk, having a pair of white gloves tied therein, with tassels of silk and gold at the end; which mantles are adorned upon the left shoulders with the ensign of the order, being three imperial crowns or, surrounded with the ancient motto of this knighthood, *Tria juncta in uno*, wrought upon a circle gules, with a glory or rays issuing from the centre, and under it the lace of white silk heretofore worn by the knights of the Bath. They have red breeches and stockings, and have white hats, with a plume of white feathers thereon. The king allowed the chapel of King Henry VII. to be the chapel of

the order, and ordered that each knight's banner, with plates of his arms and styles, should be placed over their several stalls, in like manner as the knights of the Garter in St George Chapel in the castle of Windsor; and he allowed them supporters to their arms. His Royal Highness Prince William, second son to the Prince of Wales, on this occasion, was made the first knight-companion, and his Grace the Duke of Montagu grand master of the order, the dean of Westminster (for the time being) dean of the order; the other officers of which are, Bath king of arms, a genealogist, register and secretary, gentleman usher, and messenger.

BATH, *Balneum*, a convenient receptacle of water for persons to wash or plunge in, either for health or pleasure.—Baths are distinguished into *hot* and *cold*; and these again are either natural or artificial. The natural hot baths are formed of the water of hot springs, of which there are many in different parts of the world; especially in those countries where there are or have evidently been volcanoes. The artificial hot baths consist either of water or of some other fluid made hot by art. The cold bath consists of water, either fresh or salt, in its natural degree of heat; or it may be made colder by art, as by a mixture of nitre, sal-ammoniac, &c. The chief hot baths in our country are those of Bath and Bristol, in Somersetshire; and those others of Buxton and Matlock, in Derbyshire; which latter, however, are rather warm or tepid than hot. The use of these baths is found beneficial in diseases of the head, as palsies, &c. in cuticular diseases, as leprosy, &c. obstructions and constipations of the bowels, the scurvy and stone, and in most diseases of women and children. The baths have performed many cures, and are commonly used as a last remedy in obstinate chronic diseases; where they succeed well, if they agree with the constitution of the patient: but whether they will agree or not, cannot be known without trial.

As to the origin of those hot waters, of which the natural hot baths are formed, we are very much in the dark. All that can be affirmed with certainty is, that where there are volcanoes, there also there are hot springs in great abundance; but how the heat of the volcano should be constantly communicated to the waters of a spring for many ages, during a great part of which the volcano itself has lain in a dormant state, seems almost beyond the reach of investigation. Another thing that creates a great difficulty is, that the fire of a volcano must certainly lie very deep in the earth, and most probably shifts from place to place; but the waters of a spring must always issue from a place situated lower than the origin of the spring itself. Besides, though we should suppose the water to come from the top of a volcano itself, and consequently boiling hot, it could not be supposed to percolate far through cold earth, without losing all the heat it acquired from the volcano. From some observations, however, it certainly does appear, that there are some spots on the earth which have a power of producing heat within themselves, independent of any thing foreign; and that water is so far from being able to destroy this power, that it seems rather to promote and continue it. We know that water hath this effect upon a mixture of iron-filings and sulphur; but whatever quantities of similar substances

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stances we may suppose to be contained in the earth, we must also suppose to be destroyed by one great conflagration soon after they have begun to act upon each other, so that by their means no lasting heat in waters could be produced. Dr Stukeley indeed would solve this, and several other phenomena, by making the fire and smoke of volcanoes the effects of electricity: but here sufficient proof is wanting; for electricity, even in its most powerful state, is not very apt to set bodies on fire. The thought, however, deserves attention; for if electricity is capable of setting a volcano on fire, it is undoubtedly capable of producing solfaterras where it meets with proper materials, and from them springs of any degree of heat.

The cold bath is found one of the most universal and innocent remedies yet discovered, though still its use is not to be adopted without precautions.

BATHS in vapour, the fume or steam of some decoction is received upon the body to promote a perspiration.—These are also by some called *Balnea Lacnica*.

Vapour baths are, when the patient is not plunged into what is prepared for the bath, but only receives its steam upon those parts of his body which require it: as in some distempers of the fundament and womb, where the patient sits and receives the fumes of some proper fomentation, &c. To these may be added the bagnio; where people are made to sweat by the heat of a room, and pouring on of hot water; after which they generally go into a hot bath or bagnio.

A peculiar sort of vapour-bath was much used by the ancient Mexicans, and is still in use among the present Indians their descendants. According to the Abbe Clavigero, these baths are built of raw bricks, and their form is similar to that of ovens for baking bread: but with this difference, that the pavement of the bath is a little convex, and lower than the surface of the earth; whereas that of most ovens is plain, and a little elevated for the accommodation of the baker. The greatest diameter of a bath is about eight feet, and its greatest height six. The entrance, like the mouth of an oven, is wide enough to allow a man to creep easily in. In the place opposite to the entrance there is a furnace of stone or raw bricks, with its mouth outwards to receive the fire, and a hole above it to carry off the smoke. The part which unites the furnace to the bath, and which is about two feet and a half square, is shut with a certain dry stone of a porous texture. In the upper part of the vault there is an air-hole, like that to the furnace. This is the usual structure of the temazcalli; but there are others that are without vault or furnace, mere little square chambers, yet well covered and defended from the air.—When any person goes to bathe, he first lays a mat within the temazcalli, a pitcher of water, and a bunch of herbs or leaves of maize. He then causes a fire to be made in the furnace, which is kept burning until the stones which join the bath and furnace are quite hot. The person who is to use the bath enters commonly naked, and generally accompanied for the sake of convenience, or on account of infirmity, by one of his domestics. As soon as he enters, he shuts the entrance close, but leaves the air-hole at top for a little time open, to let out any smoke which may have been introduced thro' the chinks of the stone; when it is all out he likewise

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stops up the air-hole. He then throws water upon the hot stones, from which immediately arises a thick steam to the top of the temazcalli. While the sick person lies upon the mat, the domestic drives the vapour downwards, and gently beats the sick person, particularly on the ailing part, with the bunch of herbs, which are dipped for a little while in the water of the pitcher, which has then become a little warm. The sick person falls immediately into a soft and copious sweat, which is increased or diminished at pleasure, according as the case requires. When the evacuation desired is obtained, the vapour is let off, the entrance is cleared, and the sick person clothes himself, or is transported on the mat to his chamber; as the entrance to the bath is usually within some chamber of his habitation.—This sort of bath, called *temazcalli* by the natives, has been regularly used in several disorders, particularly in fevers occasioned by costiveness. The Indian women use it commonly after childbirth, and also those persons who have been stung or wounded by any poisonous animal. It is undoubtedly a powerful remedy for all those who have occasion to carry off gross humours; and certainly it would be most useful in Italy, where the rheumatism is so frequent and afflicting. When a very copious sweat is desired, the sick person is raised up and held in the vapour; as he sweats the more the nearer he is to it. The temazcalli is so common, that in every place inhabited by the Indians there are many of them.

BATHS (Dry), are those made of ashes, salt, sand, shreds of leather, and the like.—The ancients had divers ways of sweating by a dry heat; as by the means of a hot sand, stove-rooms, or artificial bagnios, and certain natural hot steams of the earth, received under a proper arch, or hot-house, as we learn from Celsus. They also had another kind of bath by insolation, where the body was exposed to the sun for some time, in order to draw forth the superfluous moisture from the inward parts; and to this day it is a practice in some nations to cover the body over with horse-dung, especially in chronical diseases, to digest and breathe out the humour that causes the distemper. In New England they make a kind of stoves of turf, wherein the sick are shut up to bathe or sweat.

The same name is sometimes also given to another kind of bath, made of kindled coals, or burning spirit of wine; the patient being placed in a convenient close chair for the reception of the fume, which rises and provokes sweat in a plentiful manner: care is here taken to keep the head out, and to secure respiration. This bath has been found very effectual in removing old obstinate pains in the limbs, and venereal complaints; and will often complete a cure left unperformed by salivation.

Some authors speak of bloody baths, *balnea sanguinolenta*, prepared especially of the blood of infants, anciently supposed to be a kind of specific for the leprosy.

BATHS (Metalline), those made of water impregnated with the *scoria* of metals. The most common and useful of this kind are those prepared with the *scoria* of iron, which abound with the earthy, saline, and sulphureous substance of the metal; and these are of excellent service for strengthening and bracing up the part to which they are applied, and recovering weak and de-

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cayed limbs; stopping various kinds of bleeding; and restoring the menstrual and hemorrhoidal flux where obstructed; insomuch, that they may well be substituted for the natural iron baths.

Adjacent to the smelting huts where metals are run from their ore, are to be found large quantities of the slag of copper, antimony, and cobalt, which abounding with sulphur, vitriolic salt, and an earthy principle, make serviceable baths for strengthening the lost tone of the fibres, and relaxing them when they are too stiff. These baths have likewise a deterfive and cleansing virtue; so that with prudence, and due regard to circumstances, they may be used on many occasions. The way of making these artificial baths is, either to take the slags as they come hot from the furnace, or else to heat them afresh, and throw them into hot water; which is afterwards to be used either in the way of bath, or fomentation, occasionally. There are other artificial baths, prepared of alum and quicklime, by boiling them together in fine rain-water. Such baths are highly serviceable in paralytic disorders and weakness of the limbs.

The pepper bath, or peffer wasser, on the Alps, is one of the most celebrated in Europe, and has been the subject of treatises express, besides what has been said of it occasionally by Scheuchzer and others. It was first discovered in the year 1240, and is of the periodical kind. The water breaks forth in a dreadful place, scarce accessible to the sun-beams, or indeed to men, unless of the greatest boldness, and such as are not in the least subject to dizziness. These baths have this singularity above all others, that they commonly break forth in May, and that with a sort of impetuosity, bringing with them beech-leaves, crabs, or other wood-fruit; and that their course desists in September or October. Scheuchzer professes himself of opinion, that these waters are not impregnated with any minerals, or if they do contain any, that their virtues in curing distempers and preserving health do not proceed from them. They are exceeding clear, destitute of colour, taste, or smell.

BATHS, (*Balnea*), in architecture, denote large pompous buildings among the ancients, erected for the sake of bathing. Baths made a part of the ancient *gymnasia*, though they were frequented more for the sake of pleasure than health.

The most magnificent baths were those of Titus, Paulus Æmilius, and Dioclesian, of which there are some ruins still remaining. It is said that at Rome there were 856 public baths. Fabricius adds, that the excessive luxury of the Romans appeared in nothing more visible than in their baths. Seneca complains, that the baths of plebeians were filled from silver pumps; and that the freedmen trod on gems. Macrobius tells us of one Sergius Oratus, a voluptuary, who had pendant baths hanging in the air.

According to Dion, Mæcenas was the first who made a bath at Rome: yet there are instances of public baths prior to this; but they were of cold water, small, and poorly decorated. Agrippa, in his ædilate, built 160 places for bathing, where the citizens might be accommodated, either with hot or cold, *gratis*. After this example, Nero, Vespasian, Titus, Domitian, Severus, Gordian, Aurelian, Maximian, Dioclesian, and most of the emperors who studied to gain the af-

fections of the people, erected baths laid with the richest marble, and wrought according to the rules of the most delicate architecture. The rich had baths at home, and frequently very magnificent ones, especially after the time that the practice of pillaging the provinces had begun; but they only used them on extraordinary occasions. The great men, and even emperors themselves, sometimes bathed in public with the rest of the people. Alexander Severus was the first who allowed the public baths to be opened in the night-time during the heats of summer.

The Greek baths were usually annexed to *palestra* or *gymnasia*, of which they were considered as a part. These baths consisted of seven different apartments, usually separated from each other, and intermixed with other buildings belonging to the other sorts of exercises. These were, first, the cold bath, *frigida lavatio*; 2dly, The *eleothesium*, or room where they were anointed with oil; 3dly, The *frigidarium*, or cooling room; 4thly, The *propnigeum*, or entrance of the *hypocaustum*, or stove; 5thly, The vaulted room for sweating in, or vapour-bath, called *concamerata sudatio* or *tepidarium*; 6thly, The *laconicum*, or dry stove; 7thly, The hot bath, called *callida lavatio*.

As for the baths separate from the *palestra*, they appear to have been usually double, one for men, the other for women; but so near, that the same furnace heated both. The middle part was possessed by a large basin that received water by several pipes, and was surrounded by a ballustrade, behind which there was an area for the reception of those who waited to use the bath. They were vaulted over, and only received light from the top.

In the Roman baths, the first part that appeared was a large basin, called *κοιμηθρα* in Greek, and *natio* or *piscina* in Latin. In the middle was the *hypocaustum*, which had a row of four apartments on each side, called *balnearia*: these were the stove, the bath, cold bath, and *tepidarium*. The two stoves, called *laconicum* and *tepidarium*, were circular and joined together. Their floor was hollow and suspended, in order to receive the heat of a large furnace, which was communicated to the stoves through the vacuities of their floor. This furnace also heated another room called *vasarium*, in which were three large brazen vessels called *milliaria*, respectively containing hot, warm, and cold water; which were so disposed, that the water might be made to pass by syphons and pipes out of one or other of them into the bath, in order to adjust its temperature. The description is given by Vitruvius. At three in the afternoon, which is what Pliny calls *hora octava et nona*, the Romans all repaired to the baths, either the public or the private ones: this was called the *bath hour* *hora balnei*, which in winter was at nine, in summer at eight. The public baths were all opened by the sound of a bell, and always at the same hour. Those who came too late, stood a chance for bathing in cold water.

They began with hot water; after which, as the pores were now opened, and might give room for too plentiful a perspiration, they thought it necessary for their health to close them again, either with the cold bath, or at least with a sprinkling of cold water. During the bath, the body was scraped with a kind of knives, or small strigils, such as are still found in the cabinets

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cabinets of the curious. After bathing succeeded unction and perfuming, from which they went fresh to supper.

The Romans, when they found their stomachs overcharged with meat, went to the bath, as we learn from Juvenal, who inveighs against those who, having gorged themselves with eating, were forced to go into the baths to give themselves relief. They found also that a bath was good to refresh themselves after some considerable fatigue or travel, as Celsus tells us; which makes Plautus say, that all the baths in this world were not sufficient to remove the weariness he felt. After Pompey's time, the humour of bathing was carried to great excess, by which many were ruined, several having brought themselves to such a pitch, that they could not bear food without bathing first. The emperor Titus is said to have lost his life thereby. Hence Pliny inveighs severely against those physicians who held, that hot baths digested the food. The emperor Hadrian first laid a restraint on the immoderate humour of bathing, by a public edict, prohibiting all persons to bathe before the eighth hour.

BATHS of Agrippa, (therme Agrippinae,) were built of brick, but painted in enamel: those of Nero, *therma Neroniana*, were not only furnished with fresh water, but even had the sea brought into them: those of Caracalla were adorned with 200 marble columns, and furnished with 1600 seats of the same matter. Lipsius assures us they were so large, that 1800 persons might conveniently bathe in them at the same time. But the baths of Dioclesian, *therma Dioclesiana*, surpassed all the rest in magnificence. One hundred and forty thousand men were employed many years in building them. Great part of these, as well as those of Caracalla, are still standing; and with the vast high arches, the beautiful and stately pillars, the extraordinary plenty of foreign marble, the curious vaulting of the roofs, the prodigious number of spacious apartments, and a thousand other ornaments, make one of the greatest curiosities of modern Rome.

BATH, in chemistry. Several matters employed to transmit heat are called baths; but the substances most frequently used by chemists for this purpose are water and sand. When water is employed, it is called *Balneum Mariæ*, or *water bath*; which is very much used, very convenient for many operations, and may be employed successfully for all degrees of heat inferior to that of boiling water. As water, when exposed to fire in any vessel from which it can evaporate, does only receive a determinate degree of heat, which always remains the same when once it has arrived to the boiling heat, it follows, that by the water bath, a degree of heat always equal may be transmitted with certainty. Farther, this degree of heat being incapable of burning, or of communicating an empyreumatic quality to matters susceptible of it, the water bath has also the advantage of not exposing substances to this inconvenience. When vessels in which distillations and digestions are made, are placed in sand, then a sand bath is formed. This intermediate substance of sand is very convenient, to moderate the too great activity of the naked fire, and to transmit any degree of heat, from the weakest to a red heat. As this bath is attended with less trouble, and requires less apparatus than the water bath, it is much used in laborato-

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ries. Nothing is requisite for the sand bath, but an earthen or iron vessel filled with fine sand, which is fitted into a furnace, and capable of containing the cucurbits, retorts, matrasles, or other vessels containing the matter to be operated upon.

BATH, in metallurgy, is used to signify the fusion of metallic matter in certain operations. In refining or cupelling, for example, the metals are said to be in bath when they are melted. When gold is purified by antimony, this semi-metal melted, is called by some the *bath of gold*; alchemists, who consider gold as the king of metals, call antimony the *bath of the king only*; because in fact gold only can resist the action of antimony.

BATH, in Hebrew antiquity, a measure of capacity, containing the tenth part of an omar, or seven gallons and four pints, as a measure for things liquid; or three pecks and three pints, as a measure for things dry.

BATH Kol, the daughter of a voice. So the Jews call one of their oracles, which is frequently mentioned in their books, especially the Talmud; being a fantastical way of divination invented by the Jews themselves, though called by them a revelation from God's will, which he made to his chosen people, after all verbal prophecies had ceased in Israel. It was in fact a method of divination similar to the *sortes Virgilianæ* of the Heathens. For as, with them, the first words they happened to dip into, in the works of that poet, were a kind of oracle whereby they predicted future events; so, with the Jews, when they appealed to Bath-kol, the first words they heard from any man's mouth were looked upon as a voice from heaven, directing them in the matter they inquired about. The Christians were not quite free from this superstition, making the same use of the book of the Scriptures as the Pagans did of the works of Virgil. It was practised by Heraclius, emperor of the east, in the beginning of the seventh century: for, being at war with Chosroes king of Persia, and in doubt, after a successful campaign, where to take up his winter quarters, he consulted the book of the scriptures in this way of divination, and was determined thereby. In France, it was the practice for several ages to use this kind of divination at the consecration of a bishop, in order to discover his life, manners, and future behaviour. This usage came into England with the Norman conquest; for we are told, that at the consecration of William the second Norman bishop of the diocese of Norwich, the words which first occurred on dipping into the Bible were, *Not this man, but Barrabus*: soon after which, William died, and Herbert de Lozinga, chief simony broker to King William Rufus, succeeded him; at whose consecration the words at which the Bible opened were the same which Jesus spoke to Judas the traitor; *Friend, wherefore art thou come?* This circumstance so affected Herbert, that it brought him to a thorough repentance of his crime; in expiation of which he built the cathedral church of Norwich, the first stone of which he laid in the year 1096.

BATHA, *BATH*, or *Bachia*, a town of Hungary, and capital of a county of the same name, seated on the Danube. E. Long. 20. 40. N. Lat. 46. 40.

BATHING, the act of using or applying a bath; that is, of immersing the body, or part of it, in water or other fluid.

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Bathing is a practice of great antiquity. The Greeks, as early as the heroic age, are said to have bathed themselves in the sea, in rivers, &c. We even find mention in Homer of hot baths in the Trojan times; but these seem to have been very rare, and only used on extraordinary occasions. Athenæus speaks of hot baths as unusual even in his age. In reality, public baths appear to have been discouraged, and even prohibited, by the ancient Greeks, who were contented to wash themselves at home in a sort of bathing-tubs. The method of bathing among the ancient Greeks was, by heating water in a large vessel with three feet, and thence pouring it on the head and shoulders of the person seated in a tub for that purpose, who at coming out was anointed with oil.

The Romans were also long before they came into the use of baths; the very name of which, *thermae*, shows they borrowed it from the Greeks. As the ancient Romans were chiefly employed in agriculture, their custom was, every evening after work, to wash their arms and legs, that they might sit down to supper with more decency: for it is to be observed, the use of linen was then unknown; and the people of that age went with their arms and legs bare, and consequently exposed to dust and filth. But this was not all; for every ninth day, when they repaired to the city, either to the *nundinae* or to attend at the assemblies of the people, they bathed all over in the Tiber, or some other river which happened to be nearest them. This seems to have been all the bathing known till the time of Pompey, when the custom began of bathing every day. See BATH.

The Celtic nations were not without the use of bathing: the ancient Germans bathed every day in warm water in winter, and in summer in cold. In England, the famous bath in Somersetshire is said by some to have been in use 800 years before Christ. Of this, however, it must be owned, we have but very slender evidence: but Dr Musgrave makes it probable that it was a place of considerable resort in Geta's time; there being still the remains of a statue erected to that general, in gratitude for some benefactions he had conferred upon it.

Although bathing, among the ancients, made, as it were, a part of diet, and was used as familiarly as eating or sleep; yet it was in high esteem among their physicians for the cure of diseases, as appears from Strabo, Pliny, Hippocrates, and Oribasius; whence frequent exhortations to washing in the sea, and plunging into cold water. The first instance of cold bathing, as a medicine, is Melampus's bathing the daughters of the king of Argos; and the first instance of warm bathing is Medea's use of it, who was said to boil people alive, because Pelias king of Theffaly died in a warm bath under her hands. The cold bath was used with success by Antonius Musa, physician to the emperor Augustus, for the recovery of that prince; but fell into neglect after the death of Marcellus, who was thought to have been destroyed by the improper use of it. It was again brought into request towards the close of the reign of Nero, by means of a physician of Marseilles named *Charmis*; but during the ignorance of the succeeding ages, the practice was again banished for a long time.—Both hot and cold bathing are now prescribed in many cases by the physicians,

though they are not agreed as to the manner in which they operate on the human body. See MEDICINE-Index.

Bathing among the Turks, as among the ancients, makes a part of diet and luxury; and in every town, and even village, there is a public bath. Indeed, the necessity of cleanliness, in a climate where one perspires so copiously, has rendered bathing indispensable; the comfort it produces preserves the use of it; and Mahomet, who knew its utility, has reduced it to a precept. Of these baths, and the manner of bathing particularly at Cairo, the following account is given by M. Savary in his Letters on Egypt.

“The first apartment one finds in going to the bath, is a large hall, which rises in the form of a rotunda. It is open at the top, to give a free circulation to the air. A spacious estrade, or raised floor, covered with a carpet, and divided into compartments, goes around it, on which one lays one's clothes. In the middle of the building, a jet-d'eau spouts up from a basin, and agreeably entertains the eye. When you are undressed, you tie a napkin round your loins, take a pair of sandals, and enter into a narrow passage, where you begin to be sensible of the heat. The door shuts to; and, at 20 paces off, you open a second, and go along a passage, which forms a right angle with the former. Here the heat increases. They who are afraid of suddenly exposing themselves to a stronger degree of it, stop in a marble hall, in the way to the bath properly so called. The bath is a spacious and vaulted apartment, paved and lined with marble, around which there are four closets. The vapour incessantly arising from a fountain and cistern of hot water, mixes itself with the burning perfumes. These, however, are never burnt except the persons who are in the bath desire it. They mix with the steam of the water, and produce a most agreeable effect.

“The bathers are not imprisoned here, as in Europe, in a sort of tub, where one is never at one's ease. Extended on a cloth spread out, the head supported by a small cushion, they stretch themselves freely in every posture, whilst they are wrapped up in a cloud of odoriferous vapours, which penetrates into all their pores. After reposing there some time, until there is a gentle moisture over the whole body, a servant comes, presses you gently, turns you over, and when the limbs are become supple and flexible he makes all the joints crack without any difficulty. He masses * and seems to knead * “Mass” comes from the Arabic verb *masi*, which signifies touching in a delicate manner. the flesh without making you feel the smallest pain. This operation finished, he puts on a stuff glove, and rubs you a long time. During this operation, he detaches from the body of the patient, which is running with sweat, a sort of small scales, and removes even the imperceptible dirt that stops the pores. The skin becomes soft and smooth like satin. He then conducts you into a closet, pours the lather of perfumed soap upon your head, and withdraws. The ancients did more honour to their guests, and treated them in a more voluptuous manner. Whilst Telemachus was at the court of Nestor, ‘the beautiful Polycasta, the handsomest of the daughters of the king of Pylos, led the son of Ulysses to the bath; washed him with her own hands; and, after anointing his body with precious oils, covered him with rich habits and a splendid cloak.’ Pisistratus and Telemachus were not worse treated in the

Bathing the palace of Menelaus. ' When they had admired its beauties, they were conducted to basins of marble, where a bath was prepared: Beautiful female slaves washed them; and, after anointing them with oil, covered them with rich tunics and superb pellices.

" The closet to which one is conducted is furnished with a cistern and two cocks: one for cold and the other for hot water. There you wash yourself. Soon after the servant returns with a depilatory pomatum, which in an instant makes the hair fall off the places it is applied to. Both men and women make general use of it in Egypt. It is composed of a mineral called *rufma*, which is of a deep brown. The Egyptians burn it lightly, knead it with water, mixing it with half the quantity of slaked lime. This greyish paste applied to the hair, makes it fall off in two or three minutes, without giving the slightest pain.

" After being well washed and purified, you are wrapped up in hot linen, and follow the guide through the windings that lead to the outer apartment. This insensible transition from heat to cold prevents one from suffering any inconvenience from it. On arriving at the estrade, you find a bed prepared for you; and scarcely are you laid down before a child comes to press every part of your body with his delicate fingers, in order to dry you thoroughly. You change linen a second time, and the child gently grates the callosity of your feet with pumice stone. He then brings you a pipe and Moka coffee.

" Coming out of a stove where one was surrounded by a hot and moist fog, where the sweat gushed from every limb, and transported into a spacious apartment open to the external air, the breast dilates, and one breathes with voluptuousness. Perfectly massed, and as it were regenerated, one experiences an universal comfort. The blood circulates with freedom; and one feels as if disengaged from an enormous weight, together with a suppleness and lightness to which one has been hitherto a stranger. A lively sentiment of existence diffuses itself to the very extremities of the body. Whilst it is lost in delicate sensations, the soul, sympathising with the delight, enjoys the most agreeable ideas. The imagination, wandering over the universe, which it embellishes, sees on every side the most enchanting pictures, every where the image of happiness. If life be nothing but the succession of our ideas, the rapidity with which they then recur to the memory, the vigour with which the mind runs over the extended chain of them, would induce a belief that in the two hours of that delicious calm that succeeds the bath, one has lived a number of years."

Such are the baths, the use of which were so strongly recommended by the ancients, and which are still the delight of the Egyptians. It is by means of them that they prevent or dispel rheumatisms, catarrhs, and such cutaneous disorders as are produced by want of perspiration. Hence likewise they find a radical cure for that fatal evil which attacks the sources of generation, the remedy for which is so dangerous in Europe. By the same resource they get rid of that uncomfortable feeling so common to all nations who do not pay so much attention to the cleanliness of their bodies.— Mr Tournefort, indeed, who had used steam baths at Constantinople, where there is less refinement in them than at Cairo, is of opinion that they injure the breast.

But, according to Mr Savary, this is an error which further experience would have corrected. There are no people who make more frequent use of them than the Egyptians, and there is no country where there are fewer asthmatic people. The asthma is scarcely known there.

The women are passionately fond of these baths. They frequent them at least once a-week, and take with them slaves properly qualified for the purpose. More luxurious than the men, after undergoing the usual preparations, they wash their bodies, and above all their heads, with rose-water. It is there that female head-dressers form their long black hair into tresses, which they mix with precious essences instead of powder and pomatum. It is there that they blacken the edge of their eye-lids, and lengthen their eye-brows with *cohel*, a preparation of tin burnt with gall-nuts; it is there they stain the finger and toe nails with the leaves of *henne*, a shrub common in Egypt, and which gives them a golden colour. The linen and clothing they make use of are passed through the sweet steam of the wood of aloes; and when the work of the toilet is at an end, they remain in the outer apartment, and pass the day in entertainments. Females entertain them with voluptuous songs and dances, or tell them tales of love.

BATHURST (Ralph), M. D. an eminent physician, poet, and divine, born in the year 1620. He studied divinity in Trinity college, Oxford; but the times of confusion coming on, he changed the course of his studies, and applied himself to physic. He took a doctor's degree in that faculty; in which he rose to such eminence, that he was, in the time of the usurpation, appointed physician to the state. Upon the restoration, he quitted his profession of physic; was elected a fellow of the Royal Society, and president of his college; and having entered into holy orders, he was made chaplain to the king, and afterwards dean of Wells. Soon after, he served the office of vice-chancellor of Oxford, and was nominated by king William and queen Mary to the see of Bristol; which he refused to accept. His learning and talents were various. He was an orator, a philosopher, and a poet: he possessed an inexhaustible fund of wit, and was a facetious companion at 80 years of age. Ridicule was the weapon with which he used to correct the delinquents of his college; and he was so absolute a master of it, that he had it always at hand. His poetical pieces in the *Musæ Anglicanæ* are excellent in their kind. He wrote several poems, both in English and Latin; and died June 14. 1704, in the 84th year of his age.

BATHURST (Allen), Earl of Bathurst, one of the last worthies of queen Anne's reign, that shining period of triumphs, taste, genius, and elegance, was born in the year 1684. His studies and his education were equally conducive to the brilliant figure he was destined to make in social life and in the senate, as a polite scholar, a patriot, and a statesman. These talents he had an opportunity to display as early as the year 1705; when, at the request of his father Sir Benjamin Bathurst, and the solicitation of the constituents of Cirencester, he served in parliament for that borough, his native soil, with reputation and integrity. He distinguished himself particularly in the struggles and debates relative to the union between the two kingdoms,

Bathurst. firmly supporting this measure, calculated to strengthen the vigour of government by uniting its force. Tho' he was contented to act a subordinate character in the great opposition planned by Mr Harley and Mr St John, his intimate friends, to sap the credit of the Duke of Marlborough and his adherents, he was of infinite service to his party in arraigning, with spirit and eloquence, the conduct of the General and the Earl of Godolphin, who had long governed the Queen, and lavished the treasures of the nation on conquests more splendid than serviceable. The loss of the battle of Almanza seconded his efforts to dispel the intoxication of former successes. His personal regard for Lord Somers, president of the council, was never altered, though they were of different opinions in politics; and when he was divested of his office, Mr Bathurst acted with such tenderness and delicacy, as to preserve the esteem of Lord Somers in a private station. In consideration of his zeal and services, the Queen advanced him, in 1711, to the dignity of a peer, by the title of Baron Bathurst, of Battlesden, in Bedfordshire.

His Lordship continued to speak his sentiments with an undaunted freedom in the upper house; and stepped forth as a formidable opponent to the court-measures in the reign of George I. and during Sir Robert Walpole's administration. The acrimony of the prosecution carried on against the Earl of Oxford, Lord Bolingbroke, and the Duke of Ormond, stimulated his indignation and his eloquence against such vindictive proceedings; and he observed, "that the king of a faction was but the sovereign of half his subjects."

The south-sea scheme having infected the whole nation with a spirit of avaricious enterprize, the people awaked from their delirium, and an infinite number of families was involved in ruin. Lord Bathurst publicly impeached the directors, whose arts had enabled them by these vain expectations to amass surprising fortunes: he represented that the national honour was concerned in stripping them of their ill acquired wealth; and moved for having all the directors of the south-sea company punished by a forfeiture of their estates, for such a notorious act of sordid knavery.

When the bill was brought into the house of Lords against Dr Atterbury bishop of Rochester, that learned prelate, who joined to the graces of style and elocution all the elegance of a just delivery; among the many friends the bishop's eloquence, politeness, and ingenuity had procured him, was Lord Bathurst. He spoke against the bill with great vehemence and propriety; observing, "that if such extraordinary proceedings were countenanced, he saw nothing remaining for him and others to do, but to retire to their country-houses, and there, if possible, quietly enjoy their estates within their own families, since the least correspondence, or intercepted letter, might be made criminal." Then turning to the bishops, he said, he "could hardly account for the inveterate hatred and malice some persons bore the ingenious bishop of Rochester, unless it was that they were infatuated like the wild Americans, who fondly believe they inherit not only the spoils, but even the abilities, of the man they destroy." He was one of the Lords who entered his protest against the bill.

His Lordship was entirely averse to continental connections; and animadverted severely upon the monarch

whose thoughts were turned to foreign concerns and alliances which could never be useful; complaining of the immense sums lavished in subsidies to needy and rapacious princes.

The directors of the charitable corporation having embezzled 500,000 l. of the proprietors capital, Lord Bathurst declared, in the House of Lords, his abhorrence of this most iniquitous scene of fraud; asserting, that not one shilling of the money was ever applied to the proper service, but became the reward of avarice and venality.

His Lordship concurred, with all his power, in the opposition to Sir Robert Walpole, who now tottered on the brink of ruin. This minister, after obstinate struggles, having been forced to resign all his employments, Lord Bathurst was sworn of the privy-council, and made captain of the gentlemen-pensioners, which post he resigned in 1744. He was appointed treasurer to the present king, then Prince of Wales, in 1757, and continued in the list of privy-counsellors at his accession to the throne; but, on account of his great age, he chose to enjoy *otium cum dignitate*.

Lord Bathurst's integrity gained him the esteem even of his opponents; and his humanity and benevolence, the affection of all that knew him more intimately. He added to his public virtues all the good breeding, politeness, and elegance, of social intercourse. Dr. Freind, Congreve, Vanbrugh, Swift, Prior, Rowe, Addison, Pope, Arbuthnot, Gay, and most men of genius in his own time, cultivated his friendship, and were proud of his correspondence.

Pope, in his Epistle to him on the Use of riches, thus addresses him:

The sense to value riches, with the art
To enjoy them, and the virtue to impart;
To balance fortune by a just expence,
Join with œconomy magnificence;
With splendor, charity; with plenty, health:
O teach us, Bathurst, yet unspoil'd by wealth!
That secret rare, between th' extremes to move,
Of mad good-nature, and of mean self-love.

And Sterne in his letters to Eliza, thus speaks of him: "This nobleman is an old friend of mine: he was always the protector of men of wit and genius; and has had those of the last century always at his table. The manner in which his notice began of me, was as singular as it was polite.—He came up to me one day as I was at the Princess of Wales's court, 'I want to know you, Mr Sterne; but it is fit you should know also who it is that wishes this pleasure: you have heard (continued he) of an old Lord Bathurst, of whom your Papes and Swifts have sung and spoken so much: I have lived my life with geniuses of that cast, but have survived them; and despairing ever to find their equals, it is some years since I have closed my accounts, and shut up my books, with thoughts of never opening them again: but you have kindled a desire in me of opening them once more before I die, which I now do; so go home, and dine with me.' This nobleman, I say, is a prodigy: for at 85 he has all the wit and promptness of a man of 30; a disposition to be pleased, and a power to please others beyond whatever I knew! added to which, a man of learning, courtesy, and feeling."

His

Bathurst
||
Batiste.

His Lordship, in the latter part of his life, preserved his natural cheerfulness and vivacity, always accessible, hospitable, and beneficent. Lately he delighted in rural amusements; and enjoyed, with a philosophical satisfaction, the shade of the lofty trees he had planted himself. Till within a month of his death he constantly rode out on horseback two hours before dinner, and constantly drank his bottle of claret or Madeira after dinner. He used to declare, in a jocular manner, he never could think of adopting Dr Cadogan's method, as Dr Cheyne had assured him, 50 years ago, he would never live seven years longer unless he abridged himself of his wine. Pursuant to this maxim, his Lordship having, some years ago, invited several of his friends to spend a few cheerful days with him at his seat at Cirencester, and being one evening very loth to part with them; on his son the late chancellor's objecting to their sitting up any longer, and adding that health and long life were best secured by regularity, he suffered him to retire: but, as soon as he was gone, the cheerful father said, "Come, my good friends, since the old gentleman is gone to bed, I think we may venture to crack another bottle."

His Lordship was advanced to the dignity of Earl in 1772; and lived to see the above nobleman, his eldest son, several years Lord High Chancellor of Great Britain, and promoted to the peerage in 1771 by the title of Baron Apsley. Lord Bathurst married Catharine daughter of Sir Peter Apsley, by whom he had two other sons and five daughters. His death happened, after a few days illness, at his seat near Cirencester, in the 91st year of his age, and on the 16th of September 1775.

BATHYLLUS and PYLADES, inventors of pantomime entertainments on the stage. Bathyllus succeeded in representing comedy; Pylades in tragedy. The art consisted in expressing the passions by gestures, attitudes, and dumb show; not, as in modern times, in machinery, and the fooleries of Harlequin. They flourished at Rome, under Augustus, about A. D. 10. Each of them kept scholars, who perpetuated their master's name: for the followers of Bathyllus, who excelled in the comic part, called themselves *Bathylli*; and those of Pylades, who excelled in the tragic, called themselves *Pylade*.

BATILLUS, a musical instrument made of metal, in the form of a staff, furnished with metalline rings, which being struck, yielded a kind of harmonical sounds; used by the Armenians in their church-service.

BATIS; a genus of the tetrandria order, belonging to the dicæcia class of plants, the characters of which are: Of the male, the amentum is four ways imbricated, and both the calyx and corolla are wanting: of the female, the amentum is ovate, the involucre diphyllous; calyx and corolla wanting; the stigma is bilobate and sessile; the berries condunate and four-seeded. There is but one species, the *mantima*, a native of Jamaica.

BATISTE, in commerce, a fine white kind of linen cloth, manufactured in Flanders and Picardy.

There are three kinds of batiste; the first very thin; the second less thin; and the third much thicker, called *Holland Batiste*, as coming very near the goodness of Hollands.

The chief use of batiste is for neck-clothes, head-clothes, surplices, &c.

BATMAN, in commerce, a kind of weight used at Smyrna, containing six okes of 400 drams each, which amount to 16 pounds 6 ounces and 15 drams of English weight.

BATMANSON (John), prior of the Carthusian monastery, or Charter-house in the suburbs of London. He was some time a student at Oxford, but it does not appear that he took any degree in that university. He was intimately acquainted with Edward Lee archbishop of York, at whose request he wrote against Erasmus and Luther. He died in the year 1531, and was buried in the chapel belonging to the charter-house. According to Bale, he was a proud forward person; and he says that Erasmus, in one of his letters to the bishop of Winchester, calls him an ignorant fellow. Pits, on the contrary, gives him the character of a man of singular genius, zeal, piety, and learning. He wrote, 1. *Animadversiones in annotationes Erasmi in Nov. Testamentum*. 2. *A treatise against some of Luther's works*. These two he afterwards retracted. 3. *Commentaria in proverbialia Solomonis*. 4. *In cantica canticorum*. 5. *De unica Magdalena*. 6. *Institutiones noviciorum*. 7. *De contemptu mundi*. 8. *De Christo duodenni*. 9. *On the words*, *Missus est*, &c.

BATON, or BASTON. See BASTON.

BATRACHOMYOMACHIA, the battle of the frogs and the mice, the title of a fine burlesque poem generally ascribed to Homer.—The subject of the work is the death of Psyparpax, a mouse, son to Toxartes, who, being mounted on the back of Phylsignathus, a frog, on a voyage to her palace, to which she had invited him, was seized with fear when he saw himself in the middle of the pond, so that he tumbled off and was drowned. Phylsignathus being suspected to have shaken him off with design, the mice demanded satisfaction, and unanimously declared war against the frogs.

BATTÆ, (anc. geog.), a people of Germany, formerly inhabitants of what is now called *Hesse*. Being dissatisfied with their situation there, they settled on the island formed by the Vahalis and Rhine, which from them took the name of *Batavia*, or *Batavarum Insula*. Their government was a mixture of monarchy, aristocracy, and democracy. Their chief was, properly speaking, nothing more than a principal citizen, whose business was rather to advise than to command. The principal men who exercised jurisdiction, and commanded the troops, in their respective districts, were chosen, as well as the kings, in an assembly of the people. A hundred persons selected from among the people presided over every county, and acted as chiefs in the different hamlets. The whole nation was, in some measure, an army always in readiness. Each family composed a body of militia, which served under a captain of their own choosing. See *BATAVORUM Insula*.

BATTALIA, an army ranged in order of battle, or ready for engagement. The word seems formed from the Latin *batualia*, sometimes also written *batalia*, denoting a sort of military or gladiatorial exercise, as fighting with foils, or tilting at a post. In this sense, we meet with the depth of a *battalia*; to march in *battalia*, with the baggage in the middle; to break the *battalia*, &c. In the Roman *battalia*, the *hastati* made the front.

Batman
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Battalia.

Battalion
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Battel.

BATTALION, a small body of infantry, ranged in form of battle, and ready to engage.

A battalion usually contains from 500 to 800 men; but the number it consists of is not determined. They are armed with firelocks, swords, and bayonets; and divided into 13 companies, one of which is grenadiers. They are usually drawn up three men deep. Some regiments consist of but one battalion, others are divided into four or five.

BATTATAS, the Indian name of the potatoe. See CONVULVULUS.

BATTEL, a town of Suffex, five miles north-west of Hastings, situated in E. Long. 0. 35. N. Lat. 50. 55. It was formerly called *Epiton*; and is the place where William the Conqueror vanquished Harold king of England on October 14th 1066. William, in memory of this victory, erected an abbey, which he called *Battel Abbey*; and if a criminal could but reach this abbey, he was dismissed from thence, and was afterwards in no danger for his past faults. The abbey was a large and noble structure, as may be judged by the gateway which is still entire, as well as from the other remains. This place is noted for making gunpowder equal to that of Dantzick; and the best goes by the name of *Battel gunpowder*.

BATTEL, in law, or *Trial by wager of Battel*, a species of trial of great antiquity, but now much disused. It seems to have owed its original to the military spirit of our ancestors, joined to a superstitious frame of mind; it being in the nature of an appeal to Providence, under an apprehension and hope (however presumptuous and unwarrantable), that heaven would give the victory to him who had the right. The decision of suits, by this appeal to the God of battels, is by some said to have been invented by the Burgundi, one of the northern or German clans that planted themselves in Gaul. And it is true, that the first written injunction of judiciary combats that we meet with, is in the laws of Gundebal, A. D. 501, which are preserved in the Burgundian code. Yet it does not seem to have been merely a local custom of this or that particular tribe, but to have been the common usage of all those warlike people from the earliest times. And it may also seem, from a passage in Velleius Paterculus, that the Germans, when first they became known to the Romans, were wont to decide all contests of right by the sword: for when Quintilius Varus endeavoured to introduce among them the Roman laws and method of trial, it was looked upon (says the historian) as a *novitas incognitæ disciplinæ, ut solita armis decerni jure terminarentur*. And among the ancient Goths in Sweden we find the practice of judiciary duels established upon much the same footing as they formerly were in our own country.

This trial was introduced in England among other Norman customs by William the Conqueror; but was only used in three cases, one military, one criminal, and the third civil. The first in the court martial, or court of chivalry and honour; the second in appeals of felony; and the third upon issue joined in a writ of right, the last and most solemn decision of real property. For in writs of right the *jus proprietatis*, which is frequently a matter of difficulty, is in question; but other real actions being merely questions of the *jus possessionis*, which are usually more plain and obvious, our ancestors did

not in them appeal to the decision of Providence. Another pretext for allowing it, upon these final writs of right, was also for the sake of such claimants as might have the true right, but yet by the death of witnesses or other defect of evidence be unable to prove it to a jury. But the most curious reason of all is given in the Mirror, that it is allowable upon warrant of the combat between David for the people of Israel of the one party, and Goliath for the Philistines of the other party: a reason which Pope Nicholas I. very seriously decides to be inconclusive. Of battel therefore on a writ of right we shall first speak: and although the writ of right itself, and of course this trial thereof, be at present disused; yet, as it is law at this day, it may be matter of curiosity, at least, to inquire into the forms of this proceeding, as we may gather them from ancient authors.

1. The last trial by battel that was waged in the court of common pleas at Westminster (though there was afterwards one in the court of chivalry in 1631, and another in the county palatine of Durham in 1638) was in the 13th year of Queen Elizabeth, A. D. 1571, as reported by Sir James Dyer; and was held in Tot-hill-fields, Westminster, "*non sine magna juris consultorum perturbatione*," saith Sir Henry Spelman, who was himself a witness of the ceremony. The form, as appears from the authors before cited, is as follows.

When the tenant in a writ of right pleads the general issue, viz. that he hath more right to hold than the demandant hath to recover; and offers to prove it by the body of his champion, which tender is accepted by the demandant; the tenant in the first place must produce his champion, who, by throwing down his glove as a gage or pledge, thus wages or stipulates battel with the champion of the demandant; who, by taking up the gage or glove, stipulates on his part to accept the challenge. The reason why it is waged by champions, and not by the parties themselves, in civil actions, is because, if any party to the suit dies, the suit must abate and be at an end for the present; and therefore no judgment could be given for the lands in question, if either of the parties were slain in battel: and also that no person might claim an exemption from this trial, as was allowed in criminal cases where the battel was waged in person.

A piece of ground is then in due time set out, of 60 feet square, inclosed with lists, and on one side a court erected for the judges of the court of common pleas, who attend there in their scarlet robes; and also a bar is prepared for the learned serjeants at law. When the court sits, which ought to be by sunrising, proclamation is made for the parties and their champions; who are introduced by two knights, and are dressed in a coat of armour, with red sandals, barelegged from the knee downwards, bareheaded, and with bare arms to the elbows. The weapons allowed them are only batons, or staves, of an ell long, and a four-cornered leather target; so that death very seldom ensued this civil combat. In the court military, indeed, they fought with sword and lance, according to Spelman and Rushworth; as likewise in France, only villeins fought with the buckler and baton, gentlemen armed at all points. And upon this, and other circumstances, the president Montesquieu hath with great ingenuity not only deduced the impious custom of private duels upon imagi-

nary

Battel.

Battel.

nary points of honour, but hath also traced the heroic madness of knight-errantry from the same original of judicial combats. But to proceed:

When the champions, thus armed with batons, arrive within the lists or place of combat, the champion of the tenant then takes his adversary by the hand, and makes oath that the tenements in dispute are not the right of the demandant; and the champion of the demandant, then taking the other by the hand, swears in the same manner that they are; so that each champion is, or ought to be, thoroughly persuaded of the truth of the cause he fights for. Next an oath against sorcery and enchantment is to be taken by both the champions, in this or a similar form: "Hear this, ye justices, that I have this day neither eat, drank, nor have upon me neither bone, stone, nor grass; nor any enchantment, sorcery, or witchcraft, whereby the law of God may be abased, or the law of the devil exalted. So help me God and his saints."

The battel is thus begun, and the combatants are bound to fight till the stars appear in the evening: and, if the champion of the tenant can defend himself till the stars appear, the tenant shall prevail in his cause; for it is sufficient for him to maintain his ground, and make it a drawn battel, he being already in possession; but, if victory declares itself for either party, for him is judgment finally given. This victory may arise from the death of either of the champions: which indeed hath rarely happened; the whole ceremony, to say the truth, bearing a near resemblance to certain rural athletic diversions, which are probably derived from this original. Or victory is obtained if either champion proves *recreant*, that is, yields, and pronounces the horrible word of *craven*; a word of disgrace and obloquy, rather than of any determinate meaning. But a horrible word it indeed is to the vanquished champion: since, as a punishment to him for forfeiting the land of his principal by pronouncing that shameful word, he is condemned as a recreant, *amittere liberam legem*, that is, to become infamous, and not to be accounted *liber et legalis homo*; being supposed by the event to be proved forsworn, and therefore never to be put upon a jury, or admitted as a witness in any cause.

This is the form of a trial by battel; a trial which the tenant, or defendant in a writ of right, has it in his election at this day to demand; and which was the only decision of such writ of right after the conquest, till Henry II. by consent of parliament, introduced the *grand assise*, a peculiar species of trial by jury, in concurrence therewith; giving the tenant his choice of either the one or the other. Which example, of discountenancing these judicial combats, was imitated about a century afterwards in France, by an edict of Louis the Pious, A. D. 1260, and soon after by the rest of Europe. The establishment of this alternative, Glanvil, chief justice to Henry II. and probably his adviser herein, considers as a most noble improvement, as in fact it was, of the law.

* See Appeals.

2. In appeals * of felony, the trial by battel may be demanded, at the election of the appellee, in either an appeal or an approvement; and it is carried on with equal solemnity as that on a writ of right; but with this difference, that there each party hires a champion, but here they must fight in their proper persons. And

therefore, if the appellant or approver be a woman, a priest, an infant, or of the age of 60, or lame, or blind, he or she may counterplead and refuse the wager of battel; and compel the appellee to put himself upon the country. Also peers of the realm, bringing an appeal, shall not be challenged to wage battel, on account of the dignity of their persons; nor the citizens of London, by special charter, because fighting seems foreign to their education and employment. So likewise, if the crime be notorious; as if the thief be taken with the *mainour*, or the murderer in the room with a bloody knife, the appellant may refuse the tender of battel from the appellee; and it is unreasonable an innocent man should stake his life against one who is already half-convicted.

The form and manner of waging battel upon appeals are much the same as upon a writ of right; only the oaths of the two combatants are vastly more striking and solemn. The appellee, when appealed of felony, pleads *not guilty*; and throws down his glove, and declares he will defend the same by his body: the appellant takes up the glove; and replies that he is ready to make good the appeal, body for body. And thereupon, the appellee taking the book in his right hand, and in his left the right hand of his antagonist, swears to this effect: *Hoc audi, homo, quem per manum teneo, &c.* "Hear this, O man, whom I hold by the hand, who callest thyself *John* by the name of baptism, that I, who call myself *Thomas* by the name of baptism, did not feloniously murder thy father, *William* by name, nor am any way guilty of the said felony. So help me God, and the saints; and this I will defend against thee by my body, as this court shall award." To which the appellant replies, holding the bible and his antagonist's hand in the same manner as the other: "Hear this, O man, whom I hold by the hand, who callest thyself *Thomas* by the name of baptism, that thou art perjured; and therefore perjured, because that thou feloniously didst murder my father, *William* by name. So help me God, and the saints; and this I will prove against thee by my body, as this court shall award." The battel is then to be fought, with the same weapons, viz. batons, the same solemnity, and the same oath against amulets and sorcery, that are used in the civil combat: and if the appellee be so far vanquished that he cannot or will not fight any longer, he shall be adjudged to be hanged immediately; and then, as well as if he be killed in battel, Providence is deemed to have determined in favour of the truth, and his blood shall be attainted. But if he kills the appellant, or can maintain the fight from sunrise till the stars appear in the evening, he shall be acquitted. So also, if the appellant becomes recreant, and pronounces the horrible word *craven*, he shall lose his *liberam legem*, and become infamous; and the appellee shall recover his damages, and also be for ever quit, not only of the appeal, but of all indictments likewise for the same offence.

BATTEN, a name that workmen give to a scantling of wooden stuff, from two to four inches broad, and about one inch thick; the length is pretty considerable, but undetermined.—This term is chiefly used in speaking of doors and windows of shops, &c. which are not framed of whole deal, &c. with stiles, rails, and panels like wainscot; but are made to appear as if they were

Battel.
Batten.

Battenburg, were by means of these battens braded on the plain board round the edges, and sometimes cross them, and up and down.

BATTENBURG, a town of Dutch Guelderland, seated on the north banks of the Meuse, almost opposite to Ravenstein. E. Long. 5. 35. N. Lat. 50. 55.

BATTERING, the attacking a place, work, or the like, with heavy artillery.

To batter in breach, is to play furiously on a work, as the angle of a half-moon, in order to demolish and make a gape therein. In this they observe never to fire a piece at the top, but all at the bottom, from three to six feet from the ground.

The battery of a camp is usually surrounded with a trench, and pallisadoes at the bottom, with two redoubts on the wings, or certain places of arms, capable of covering the troops which are appointed for their defence. See **BATTERY**.

BATTERING-Ram, in antiquity, a military engine used to batter and beat down the walls of places besieged. It is said to have been invented by Artemanes of Clazomene, a Greek architect who flourished 441 B. C.—The machine is thus described by Josephus: It is a vast beam, like the mast of a ship, strengthened at the one end with a head of iron, something resembling that of a ram, whence it took its name. This was hung by the middle with ropes to another beam, which lay across two posts; and hanging thus equally balanced, it was by a great number of men drawn backwards and pushed forwards, striking the wall with its iron head. But this engine did most execution when it was mounted on wheels, which is said to have been first done at the siege of Byzantium under Philip of Macedon.

Plutarch informs us, that Marc Anthony, in the Parthian war, made use of a ram fourscore feet long; and Vitruvius tells us, that they were sometimes 106, and sometimes 120, feet in length; and to this perhaps the force and strength of the engine was in a great measure owing. The ram was managed at one time by a whole century of soldiers; and they being spent were seconded by another century, so that it played continually without any intermission.

Plate XCV. fig. 1. represents the battering-ram suspended. 2. The ram. 3. The form of its head, fastened to the enormous beam by three or four bands of iron, four feet in breadth. At the extremity of each of these bands (4) was a chain (5) of the same metal, one end of which was fastened to a hook (6), and at the other extremity of each of these chains was a cable firmly bound to the last link. These cables ran the whole length of the beam to the end of the ram (7), where they were all bound together as fast as possible with small ropes. To the end of these cables another was fixed, composed of several strong cords plaited together to a certain length, and then running single (8). At each of these several men were placed, to balance and work the machine. 10. The chain or cable by which it hung to the crossbeam (11), fixed on the top of the frame. 12. The base of the machine.—The unsuspended ram differed from this only in the manner of working it: for instead of being flung by a chain or cable, it moved on small wheels on another large beam.

BATTERING-Rams, in heraldry, a bearing or coat

of arms resembling the military engine of the same name. **Battery.**

BATTERY, in the military art, a parapet thrown up to cover the gunners and men employed about the guns from the enemy's shot. This parapet is cut into embrasures, for the cannon to fire through. The height of the embrasures on the inside is about three feet; but they go sloping lower to the outside. Their width is two or three feet, but open to six or seven on the outside. The mass of earth that is betwixt two embrasures, is called the *merlon*. The platform of a battery is a floor of planks and sleepers, to keep the wheels of the guns from sinking into the earth; and is always made sloping towards the embrasures, both to hinder the reverse, and to facilitate the bringing back of the gun.

BATTERY of Mortars differs from a battery of guns; for it is sunk into the ground, and has no embrasures.

Cross-BATTERIES, are two batteries which play athwart one another upon the same object, forming there an angle, and beating with more violence and destruction; because what one bullet shakes, the other beats down.

BATTERY sunk or buried, is when its platform is sunk or let down into the ground, so that there must be trenches cut in the earth, against the muzzles of the guns, for them to fire out at, and to serve for embrasures.

BATTERY d'Enfilade, is one that scours or sweeps the whole length of a straight line.

BATTERY en Echarpe is that which plays obliquely.

BATTERY de Reverse, that which plays upon the enemy's back.

Camerade BATTERY, is when several guns play at the same time upon one places.

BATTERY, in law, is the unlawful beating of another. The least touching of another's person wilfully, or in anger, is a battery, for the law cannot draw the line between different degrees of violence, and therefore totally prohibits the first and lowest stage of it; every man's person being sacred, and no other having a right to meddle with it, in any the slightest manner. And therefore, upon a similar principle, the Cornilian law *de injuriis* prohibited *pulsation* as well as *verberation*; distinguishing verberation, which was accompanied with pain, from pulsation which was attended with none. But battery is in some cases justifiable or lawful; as where one who hath authority, a parent or master, gives moderate correction to his child, his scholar, or his apprentice. So also on the principle of self defence: for if one strikes me first, or even only assaults me, I may strike in my own defence; and if sued for it, may plead *son assault demesne*, or that it was the plaintiff's own original assault that occasioned it. So likewise in defence of my goods or possession, if a man endeavours to deprive me of them, I may justify laying hands upon him to prevent him; and in case he persists with violence, I may proceed to beat him away. Thus too in the exercise of an office, as that of church-warden or beadle, a man may lay hands upon another to turn him out of church, and prevent his disturbing the congregation. And if sued for this or the like battery, he may set forth the whole case, and plead that he laid hands upon him gently, *molliter*

Fig. 1.
Battering Ram

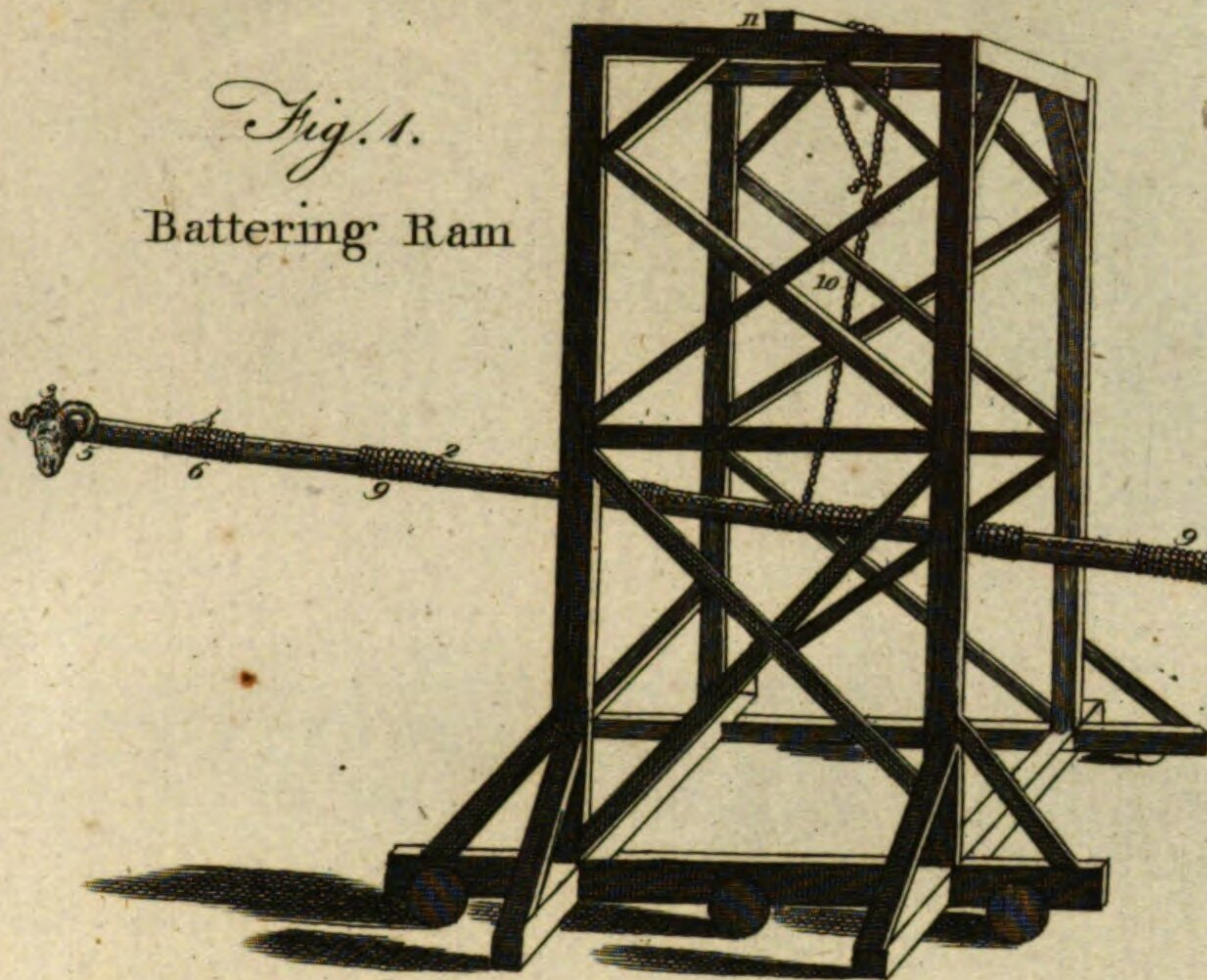


Fig. 2.
Bern
Machine
N^o 1.



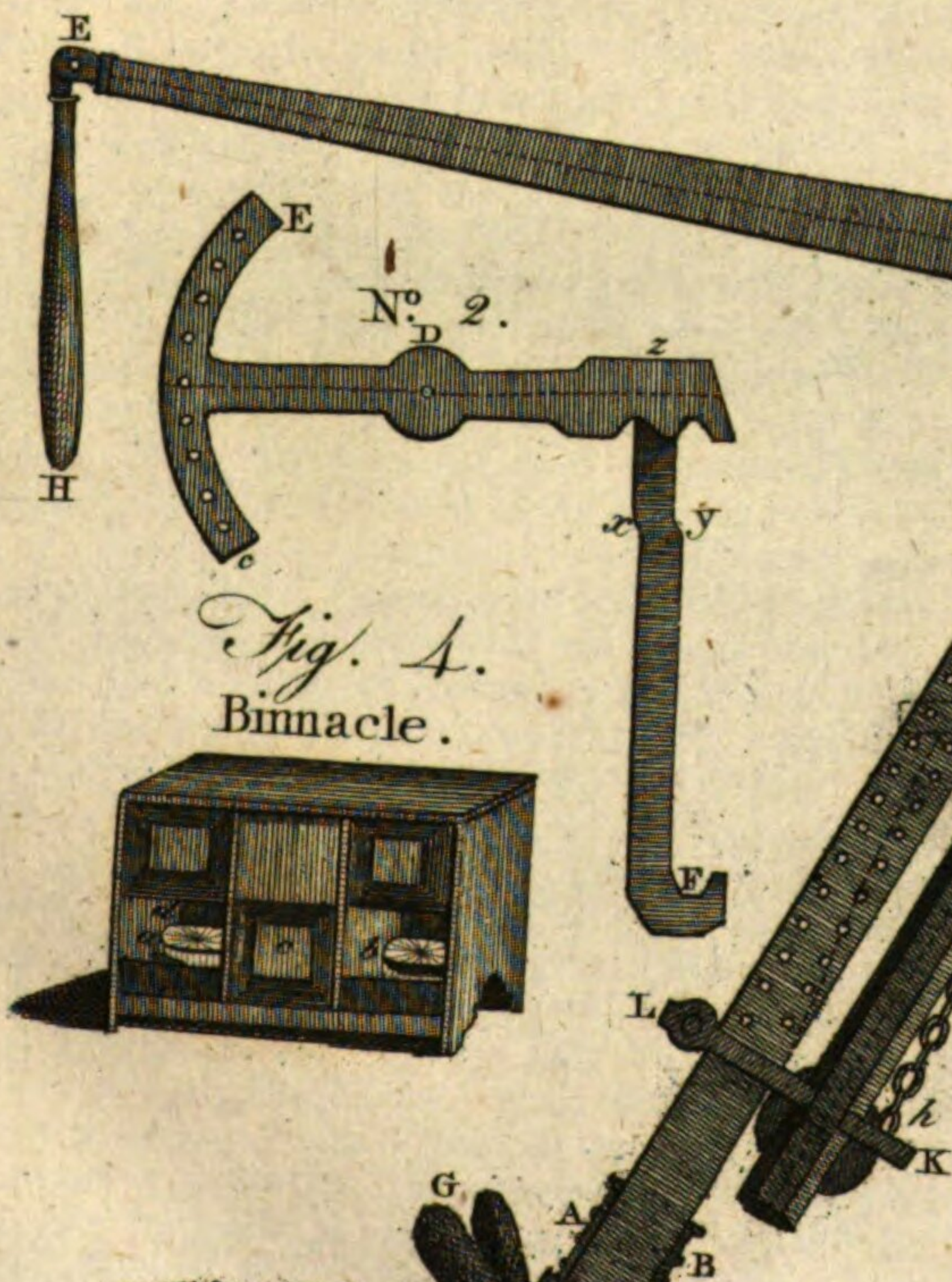
Fig. 3.
BIGNONIA RADICANS
or Trumpet Flower



Fig. 5. Blocks



Fig. 4.
Binnacle.



Battista,
Battle.

manus imposuit, for this purpose. On account of these causes of justification, battery is defined to be the unlawful beating of another; for which the remedy is, as for assault, by action of *trepas vi et armis*: wherein the jury will give adequate damages.

BATTISTA (Franco), a celebrated painter, born at Venice, was one of the disciples of Michael Angelo, whose manner he followed so closely, that, in the correctness of his out-lines, he surpassed most of the masters of his time. His paintings are pretty numerous, and dispersed all over Italy and other parts of Europe; but his colouring being very dry, they are not much more esteemed than the prints etched by his hand. He died in 1561.

BATTLE, a general engagement between two armies, in a country sufficiently open for them to encounter in front and at the same time (see WAR). The word is also written *battel*, *battell*, and *battail*. It is formed from the French *bataille*, of the Latin verb *batuere*, to fence or exercise with arms: whence *batualia* and *batalia*, which properly denoted the action or exercise of those who learned to fence, and who were hence also denominated *batuatores*.

The ancients never joined battle without much ceremony and preparation; as taking auguries, offering sacrifice, haranguing the soldiers, giving the word or a *tessera*, &c. The signals of battle were, sounding the *clausium* or general charge, and displaying a peculiar flag called by Plutarch a *purple robe*. To which may be added, singing pæans, raising military shouts, and the like. A Roman legion, ranged in order of battle, consisted of *hastati*, placed in the front; of *principes*, who were all old experienced soldiers, placed behind the former; and of *triarii*, heavy armed with large bucklers, behind the *principes*. The *hastati* were ranked close; the ranks of the *principes* were much opener, so that they could receive the *hastati*; and those of the *triarii* opener still, insomuch that they could receive both the *principes* and the *hastati* within them, without any disorder, and still facing the enemy. When therefore the *hastati* found themselves unable to stand the enemy's charge, they retired gently within the *principes*, where joining with them they renewed the combat. If these found themselves too weak to sustain the enemy, both retired among the *triarii*, where rallying, they formed a new corps, and charged with more vigour than ever. If these failed, the battle was lost: the Romans had no farther resource. The moderns are unacquainted with this method of inserting or embattling one company into another; without which the former cannot be well succoured or defended, and their places taken by others; which was a thing the Romans practised with great exactness. For the *velites*, and in later times the archers and slingers, were not drawn up in this regular manner, but either disposed of before the front of the *hastati*, or scattered up and down among the void spaces of the *hastati*, or sometimes placed in two bodies in the wings. These always began the combat, skirmishing in flying parties with the foremost troops of the enemy. If they were repulsed, which was usually the case, they fell back to the flanks of the army, or retired again in the rear. When they retired, the *hastati* advanced to the charge. As to the cavalry, it was posted at the two corners of the army, like the wings on a body; and fought some

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times on foot, sometimes on horseback. The auxiliary forces composed the two points of the battle, and covered the whole body of the Romans.—Other less usual forms of battle among the Romans were the *cuneus*, or wedge; *globus*, or round form; *forfex*, or pair of sheers; *turris*, or an oblong square figure; *ferra*, or saw. The Greeks were inferior to the Romans in marshalling their armies for battle, as they drew up their whole army in a front, and trusted the success of the day to a single force. They had three forms of battle for the horse, viz. the square, the wedge, and the rhombus or diamond form. The first held best for the defensive; the latter for the offensive; the wedge being preferred as bringing most hands to fight.

The Greeks notified the places of their battles and victories by adding the word *Nixn*; whence Nicomedia, Nicopolis, Thessalonica, &c. The ancient Britons did the like, by adding the word *Mais*; whence Maiffeveth, Malmaisbury, &c. The English by the word *Field*.—The Romans had their particular days, called *præliares dies*, wherein alone it was lawful to join battle; and others wherein it was unlawful, called *dies atri*. The Athenians, by the ancient laws of their country, were not to draw out their forces for battle till after the seventh day of the month: And Lucian relates of the Lacedæmonians, that by the laws of Lycurgus, they were not to fight before full moon. Among the Germans, it was reputed an impiety to fight in the wane of the moon; and Cæsar tells us, that Ariovistus was beaten by him, because, contrary to the laws of his country, he had fought when the moon was in her wane. The German soldiers were intimidated with the apprehension, and afforded Cæsar an easy victory; *acie commissa, impeditos religione hostes vicit*. It is well known that Jerusalem was taken by Pompey in an attack on the Sabbath-day, when by the Jewish superstitious notions, they were not allowed to fight, or even to defend themselves. The Romans did not carry their superstition so far: their *atri dies* were only observed in respect of attacking; no day was too holy for them to defend themselves in. Among the ancients, we find frequent instances of battles in the night; it was by the moonlight that Pompey beat Mithridates, and Scipio Asdrubal and Syphax.

The first pitched battle, of which we have any distinct account, is that between Cræsus and Cyrus described by Zenophon, concerning which we have a dissertation expressly by M. Freret, wherein several points of the ancient tactics are well explained. In the modern war, we find few pitched or set battles: the chief view of the great commanders of late days is rather to harass or starve the enemy by frequent alarms, cutting off his provisions, carrying off his baggage, seizing his posts, &c. than to join issue with him, and put the whole on the event of one day; a battle generally deciding the fate of a campaign, sometimes of a whole war. Hence it is a rule, never to venture a general battle, unless either you fight to advantage, or be forced to it. Joining or giving battle should always be by design: a general should never suffer himself to be forced to fight. All the measures, movements, encampments, he makes, are to lead to the execution of his great design, which is to fight to advantage, till by some mistake of the enemy, he at length find the fa-

L

vourable

Battle.

Battle-axe
||
Bavaria.

vourable opportunity. It is in this that a superior genius will at length prevail over an inferior: in the course of a campaign, he will take a number of advantages over him, which together are equivalent to a battle, the event of which is ever doubtful.

BATTLE-AXE, an ancient military weapon. Axes were a principal part of the offensive armour of the Celts. At the siege of the Roman Capitol by the Gauls under Brennus, we find one of the most distinguished of their warriors armed with a battle-axe. And Ammianus Marcellinus, many centuries afterwards, describing a body of Gauls, furnishes them all with battle-axes and swords. Some of these weapons have been found in the sepulchres of the Britons, on the downs of Wiltshire, and in the north of Scotland. Within these four or five centuries the Irish went constantly armed with an axe. At the battle of Bannockburn, king Robert Bruce clave an English champion down to the chine at one blow with a battle-axe. The axe of Lochaber hath remained a formidable implement of destruction in the hands of our Highlanders, even nearly to the present period; and it is still used by the city-guard of Edinburgh in quelling mobs, &c.

BATTLEMENTS, in architecture, are indentures or notches in the top of a wall or other building, in the form of embrasures, for the sake of looking through them.

BATTOLOGY, in grammar, a superfluous repetition of some words or things.

BATTON, in merchandise, a name given to certain pieces of wood or deal for flooring or other purposes.

BATTERY, a name given by the Hans Towns to their magazines or factories abroad. The chief of these batteries are those at Archangel, Novogrod, Berghmen, Lisbon, Venice, and Antwerp.

BATUA, *BUTUA*, *Buthoe*, or *Buthoece* (anc. anc.), a town of Dalmatia situated on the Adriatic; now *Budoa*; which see.

BATTUS, an order of penitents at Avignon and in Provence, whose piety carries them to exercise severe discipline upon themselves both in public and private.

BATZ, a copper coin mixed with some silver, and current at different rates, according to the alloy, in Nuremberg, Basil, Fribourg, Lucerne, and other cities of Germany and Switzerland.

BAVARIA, a duchy and formerly electorate of Germany. This duchy was once a kingdom, which extended from the mountains of Franconia to the frontiers of Hungary and the Adriatic Gulph. It comprehended the countries of Tirol, Carinthia, Carniola, Stiria, Austria, and other states, which are now fallen to different princes. At present it is bounded on the east by Bohemia and Austria, on the west by Suabia, on the north by Franconia, and on the south by Tirol. But the duke of Bavaria is not absolute master of all this country; for within its bounds are situated many free cities, among which is Ratisbon, and several lordships both ecclesiastical and secular. It is divided into Upper and Lower Bavaria; and these two provinces consist of 12 counties, which formerly sufficed to make a duchy, according to the laws of Franconia. The country is watered by five navigable rivers, besides several smaller ones, and 16 lakes.—It contains 35 cities, of which Munich is the capital; 94 towns; 720 castles; 4700 villages; eight great abbeys; and 75 cloisters or

monasteries, besides those of the mendicants.—It is divided into four great bailliages called *governments*. These are Munich, Landshut, Straubing, and Burghausen. The principal cities are Ingolstadt, Donauwert, Landsberg, Freiberg, Straubingen, Willhausen, Wasserberg, Eling, Rain, &c.

Besides these two provinces, the duke of Bavaria possesses the upper palatinate of Westphalia, which has been united to Bavaria, and comprehends several counties, cities, towns, and villages. On the other side of this province is Chamb, the chief city of the county of the same name, belonging likewise to the duke of Bavaria. He also possesses the landgraviate of Leichtenberg, which fell to him by the death of Maximilian Adam, in consequence of family pacts made between the house of Bavaria and that of Leichtenberg for their mutual succession. In 1567, the county of Kaag fell to the duke of Bavaria by the death of Ladislaus the last count of that name. There are likewise family pacts of mutual succession established betwixt the house of Bavaria and the Palatine of the Rhine.—The inhabitants of this country are strong and laborious, exercising themselves in shooting with rifled muskets at a mark, in order to render themselves more expert in war.

The house of Bavaria is universally allowed to be one of the most ancient in Germany. The counts of Scheyren, whose castle at present is a cloister, gave them the name. At that place are shown the tombs of more than 26 lords of Scheyren. The emperor Otho I. established as counts-palatine of Bavaria and landgraves of Scheyren, Arnolph, and Herman, sons of Arnolph brother to the duke of Berchtold of Carinthia, marquis of the county upon the Ens. After the death of Berchtold, the same emperor, instead of giving Bavaria to his son, gave it to duke Henry his brother, who had married Judith sister to Arnolph and Herman. This duke Henry of Bavaria had by his marriage Henry Hezillon, who was succeeded by his son Henry, afterwards chosen emperor by the name of Henry II. This emperor having no children by Saint Cunegond his wife, Bavaria passed again to the family of Franconia, and afterwards to that of Suabia under Henry IV. who possessed it till the year 1071, when this last emperor gave that county to Count Wolf, or Guelph, of Ravensburg in Suabia. To this Guelph, who died in the island of Cyprus, succeeded Guelph II. and to him his brother duke Henry IX. who was succeeded by his son Henry the Proud. This last had married the only daughter of the emperor Lotharius, and after the death of his father-in-law became also duke of Saxony; but refusing to deliver up the imperial ornaments of his father-in-law to the emperor Conrad III. duke of Suabia, or to acknowledge him for emperor, he was put to the ban of the empire, and lost his states. After the death of Henry, Conrad made his brother Leopold marquis of Austria and duke of Bavaria; who, dying without issue, was succeeded by his brother Henry XI. whom the emperor Frederic I. made duke of Austria, joining together the two counties above and below the Ens, and declaring them free and independent of the government of Bavaria. The same emperor gave Bavaria thus dismembered, with Saxony, to Henry the Lion, son of Henry the Proud. But Henry the Lion afterwards losing the favour of this emperor, was put to the ban of the empire: and lost all his possessions except

Bavaria.

Bavay
||
Baudius.

except Brunswick and Lunenburg, which still remain to his descendants. In 1180, the duchy of Bavaria was given by the emperor to Otho the Landgrave of Wittelsbach, count-palatine of the house of Bavaria. In the time of this Otho, the castle of Scheyren was changed into a monastery, in which the duke was buried. From him are descended the two great families that remain to this day in Germany; viz. the counts-palatine of the Rhine, and till lately electors of Bavaria. The elector of Bavaria is now extinct, and sunk in the elector-palatine; so that there are now only eight instead of nine electoral princes in Germany.

BAVAY, a small town of the province of Hainault in French Flanders; which has been often ruined by the wars of the Low Countries. E. Long. 3. 45. N. Lat. 50. 25.

BAUCIS, in fabulous history, an old woman who lived with Philemon her husband in a cottage in Phrygia. Jupiter and Mercury, travelling over that country, were well received by them, after having been refused entertainment by every body else. To punish the people for their inhumanity, these gods laid the country waste with water; but took Baucis and Philemon with them to the top of a mountain, where they saw the deluge, and their own little hut above the waters turned into a temple. Having a wish granted them, they desired to officiate in this temple as priest and priestess, and also that they might die both together; which was granted them.

BAUCONICA (anc. geog.), a town of the Vangiones in Gallia Belgica; nine miles from Mogontiacum, and eleven from Borbitomagum; and therefore supposed to be *Oppenheim*, a town in the palatinate of the Rhine, and situated on that river.

BAUDELLOT (Charles Cæsar), a learned advocate in the parliament of Paris, distinguished himself by his skill in ancient monuments, and was received into the Academy of Belles Lettres in 1705. He wrote a Treatise on the Advantages of Travelling; many Letters and Dissertations on Medals, &c.; and died in 1722, aged 74.

BAUDIER (Michael), a gentleman of Languedoc, lived in the reign of Louis XIII. and published several books, which procured him the character of a copious and laborious author; among which are, 1. An Inventory of the General History of the Turks. 2. The History of the Seraglio. 3. That of the Religion of the Turks. 4. That of the court of the king of China. 5. The Life of Cardinal Ximenes, &c.

BAUDIUS (Dominic), professor of history in the university of Leyden, born at Lisse the 8th of August 1561. He began his studies at Aix la Chapelle, and continued them at Leyden. He removed from thence to Geneva, where he studied divinity. After residing here some time, he returned to Ghent; and from thence to Leyden, where he applied to the civil law, and was admitted doctor of law in June 1585. Soon after his admission, he accompanied the ambassadors from the States to England; and during his residence here became acquainted with several persons of distinction, particularly the famous Sir Philip Sidney. He was admitted advocate at the Hague the 5th of January 1587; but being soon tired of the bar, went to travel in France, where he remained 10 years. He was much esteemed in that kingdom, and gained many friends

there. Achilles de Harlai, first president of the parliament of Paris, got him to be admitted advocate of the parliament of Paris in the year 1592. In 1602, he went to England with Christopher de Harlai, the president's son, who was sent ambassador to the court of London by Henry the Great. This same year Baudius having been named professor of eloquence at Leyden, went and settled in that university. He read lectures on history after the death of Morula, and was permitted also to do the same on the civil law. In 1611, the States conferred upon him the office of historiographer in conjunction with Meursius; and in consequence thereof he wrote The History of the Truce. Baudius is an elegant prose writer, as appears from his letters, many of which were published after his death. He was also an excellent Latin poet. The first edition of his poems was printed in the year 1587: they consist of verses of all the different measures. He published separately a book of iambics in 1591, dedicated to Cardinal Bourbon. Some of his poems he dedicated to the King of England; others to the Prince of Wales, in the edition of 1607, and went over to England to present them. He died at Leyden in 1613.

BAUDOBIRGA (anc. geog.), a town of the Treviri in Germany; now *Boppard*, in the electorate of Triers. See BOPPART.

BAUDRAND (Michael Anthony), a celebrated geographer, born at Paris July 18th 1633. He travelled into several countries; and then applied himself to the revival of Ferrarius's Geographical Dictionary, which he enlarged by one-half. He wrote, 1. Notes to Papirius Masso's description of the Rivers of France. 2. A Geographical and Historical Dictionary. 3. Christian Geography, or an Account of the Archbishoprics and Bishoprics of the whole world; and made several maps. He died at Paris May 29th 1700.

BAUHIN (John), a great botanist, was born about the middle of the 16th century. He took his doctor's degree in physic in 1562, and afterwards became principal physician to Frederick duke of Wirtemberg. The most considerable of his works is his Universal History of Plants.

BAUHIN (Caspar, or Gaspar), younger brother to the preceding, was born at Basil 1550; and distinguished himself by his skill in anatomy and botany. In 1580, he was chosen first professor of these sciences at Basil; and in 1614, was made first professor of physic and first physician of that city, which he held till his death, which happened in 1623, at the age of 63. He wrote, 1. Anatomical Institutions; 2. *Prodromus Theatri Botanici*; and other works.

BAUGE, a drugget manufactured in Burgundy, with thread spun thick and coarse wool.

BAUGE, a small town of Anjou in France, seated on the river Coesnon. E. Long. 0. 10. N. Lat. 47. 30.

BAUGE, a town of Bresse in France, with the title of a marquise. It is pleasantly situated on a fruitful hill, in E. Long. 4. 54. N. Lat. 46. 20.

BAUHINIA, MOUNTAIN EBONY: A genus of the monogynia order, belonging to the decandria class of plants; and in the natural method ranking under the 33d order, *Lomentaceæ*. The calyx is quinquefid and deciduous; the petals are oblong, expanded, and clawed, the superior one more distant, all inserted on the calyx; the capsule is a legumen.

Baudobriga
||
Bauhnia.

Bauhinia,
Bavins.

Species. 1. The aculeata, with a prickly stalk, is very common in Jamaica and other American sugar-islands, where it rises to the height of 16 or 18 feet, with a crooked stem, and divides into many irregular branches armed with strong short spines, garnished with compound winged leaves, each having two or three pair of lobes ending with an odd one, which are oblique, blunt, and indented at the top. The stalks are terminated by several long spikes of yellow flowers, which are succeeded by bordered pods about three inches long, containing two or three swelling seeds. These pods are glutinous, and have a strong balsamic scent, as have also the leaves when bruised. It is called in America the *savin-tree*, from its strong odour somewhat resembling the common savin. 2. The tomentosa, with heart-shaped leaves, is a native of Campeachy; and rises to the height of 12 or 14 feet, with a smooth stem dividing into many branches, garnished with heart-shaped leaves, having two smooth-pointed lobes. The extremity of every branch is terminated by a long spike of yellow flowers, so that when these trees are in flower they make a fine appearance. 3. The acuminata, with oval leaves, is a native of both the Indies; and rises with several pretty strong, upright smooth stems, sending out many slender branches, garnished with oval leaves deeply divided into two lobes. The flowers come out at the extremities of the branches three or four in a loose bunch; some of the petals are red, or striped with white, but others are plain upon the same branch; the stamina and style are white, and stand out beyond the petals. These flowers are succeeded by long pods of a dark brown colour, each containing five or six roundish compressed seeds. The wood of this tree is very hard, and veined with black; whence its name of *mountain ebony*. 3. The variegata, with heart-shaped leaves, and lobes joining together: this is likewise a native of both the Indies. It rises with a strong stem upwards of 20 feet high, dividing into many strong branches, garnished with heart-shaped leaves having obtuse lobes which close together. The flowers are large, and grow in loose panicles at the extremity of the branches. They are of a purplish red colour marked with white, and have a yellow bottom. The flowers have a very agreeable scent, and are succeeded by compressed pods about six inches long, and three quarters of an inch broad, containing three or four compressed seeds in each. 5. The divaricata, with oval leaves whose lobes spread different ways. This grows naturally in great plenty on the north side of the island of Jamaica. It is a low shrub, seldom rising more than five or six feet high, but divides into several branches garnished with oval leaves, dividing into two lobes that spread out from each other. The flowers grow in loose panicles at the end of the branches, have a white colour, and a very agreeable scent. The flowers appear the greatest part of the summer, so the plant is one of the greatest beauties of the hot-house. The flowers are succeeded by taper pods about four inches long, each containing four or five roundish compressed seeds of a dark colour. Besides these, five other species of bauhinia are enumerated, but the above are the most remarkable. All the species of this plant are propagated by seeds, which must be sown on hot-beds, and the plants reared in a bark-stove.

BAVINS, in war, brush faggots, made with the

brush at length. See FASCINES; and FIRE-SHIP, note (D).

BAUM, in botany. See MELISSA.

BAUME (St), a mountain of Provence in France, between Marseilles and Toulon. Here Mary Magdalen is said to have died, on which account it is much frequented.

BAUME-les-Nones, a town of Franche Comte, with a rich nunnery, seated on the river Doux, in E. Long. 6. 20. N. Lat. 47. 12. Five miles from this town is a remarkable cavern, whose entrance is 20 paces wide; and after descending 300 paces, the gate of a grotto is seen, twice as large as that of a city. The grotto is 35 paces deep, 60 wide, and is covered with a kind of a vaulted roof, from which water continually drops. There is also a small brook, said to be frozen in summer, but not in winter; and at the bottom are stones that exactly resemble candied citron-peel. When the peasants perceive a mist rising out of this cave, they affirm that it will certainly rain the next day.

BAUMEN, or BAUMAN, a cave of lower Saxony in Germany, about a mile from Wermigerode, and 18 from Goslar. The entrance is through a rock; and so narrow, that not above one person can pass at a time. There are several paths in it, which the peasants have turned up, in searching for the bones of animals which they sell for unicorn's horns. Some think this cave reaches as far as Goslar; but be this as it will, the skeletons of men have been found in it, who are supposed to have been lost in the turnings and windings.

BAUR (William), an eminent Flemish painter, was born at Strasburg, and was the disciple of Brendel. He was some time at Rome, where his studies were wholly employed about architecture and landscapes, which prevented his studying the antique. He painted small figures in distemper on vellum. He etched with great spirit. His largest works are in the historical way. He has given us many of the sieges, and battles, which wasted Flanders in the 16th century. They may be exact, and probably they are: but they are rather plans than pictures; and have little to recommend them but historic truth, and the freedom of the execution. His best prints are some characters he has given us of different nations, in which the peculiarities of each are very well preserved. His Ovid is a poor performance. He died at Vienna in 1640.

BAUSK or BAUTKO, a small but important town in the duchy of Courland, on the frontiers of Poland, with a strong castle built on a rock. It was taken by the Swedes in 1625, and by the Russians in 1705, after a bloody battle between them and the Swedes. It is seated on the river Musa, in E. Long. 24. 44. N. Lat. 56. 30.

BAUTRY, or BAWTRY, a town in the west riding of Yorkshire, on the road from London to York. It has long been noted for millstones and grindstones brought hither by the river Idle, on which it is seated. W. Long. 1. 0. N. Lat. 53. 27.

BAUTZEN, or BUDISSEN, a considerable town of Germany, and capital of Upper Lusatia, subject to the elector of Saxony, with a strong citadel. The Protestants as well as Papists have here the free exercise of their religion. E. Long. 14. 42. N. Lat. 51. 10.

BAUX, a town of Provence in France, with the title

Baum

Baux

Bawd

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Baxter.

title of a marquise, seated on a rock, at the top of which is a strong castle. E. Long. 5. O. N. Lat. 43. 42.

BAWD, a person who keeps a place of prostitution, or makes a trade of debauching women, and procuring or conducting criminal intrigues. Some think the word is derived from the old French *Baude*, bold or impudent; though Verstegan has a conjecture which would carry it higher, viz. from *bathe* anciently written *bade*. In which sense *bawd* originally imported no more than bath-holder, as if bagnios had anciently been the chief scenes of such prostitution.

The Romans had their male as well as female bawds; the former denominated *lenones* and *proagogi*, among us *panders*; the latter, *lene*. Donatus, speaking of the habits of the ancient characters in comedy, says, *Leno palis varii coloris utitur*. But the ancient *lenones*, it is to be observed, furnished boys as well as girls for venereal service. Another sort of these merchants or dealers in human flesh, were called *mangones*, by the Greeks *ανδροκαπηλοι*, who sold eunuchs, slaves, &c. By a law of Constantine, bawds were to be punished by pouring melted lead down their throats. See the next article.

BAWDY-HOUSE, a house of ill fame, to which lewd persons of both sexes resort, and there have criminal conversation.

The keeping a bawdy-house is a common nuisance, not only on account that it endangers the public peace by drawing together debauched and idle persons, and promoting quarrels, but likewise for its tendency to corrupt the manners of the people. And therefore persons convicted of keeping bawdy-houses, are punishable by fine and imprisonment; also liable to stand in the pillory, and to such other punishment as the court at their discretion shall inflict. Persons resorting to a bawdy-house are likewise punishable, and they may be bound to their good behaviour.—It was always held infamous to keep a bawdy-house: yet some of our historians mention bawdy-houses publicly allowed here in former times till the reign of Henry VIII. and assign the number to be 18 thus allowed on the bank-side in Southwark. See **STEWs** and **BROTHERs**.

Bawdy-houses are licensed in Holland, and pay a considerable tax to the state.

BAWLING, among sportsmen, is spoke of the dogs when they are too busy before they find the scent good.

BAXTER (Richard), an eminent divine among the nonconformists, was born at Rowton in Shropshire, November 12, 1615; and distinguished himself by his exemplary life, his pacific and moderate principles, and his numerous writings. He was remarkable for his piety even when he was very young. Upon the opening of the long parliament, he was chosen vicar of Kidderminster. In the heat of the civil wars he withdrew from that town to Coventry, and preached to the garrison and inhabitants. When Oliver Cromwell was made protector, he would by no means comply with his measures, though he preached once before him. He came to London just before the deposing of Richard Cromwell, and preached before the parliament the day before they voted the return of king Charles II. who upon his restoration appointed

him one of his chaplains in ordinary. He assisted at the conference in the Savoy, as one of the commissioners for stating the fundamentals in religion, and then drew up a reformed liturgy. He was offered the bishoprick of Hereford; which he refused; affecting no higher preferment than the liberty of continuing minister of Kidderminster; which he could not obtain, for he was not permitted to preach there above twice or thrice after the restoration. Whereupon he returned to London, and preached occasionally about the city, till the act of uniformity took place. In 1662, Mr Baxter was married to Margaret Charleton, daughter to Francis Charleton, Esq; of the county of Salop, who was esteemed one of the best justices of the peace in that county. She was a woman of great piety, and entered thoroughly into her husband's views concerning religion. During the plague in 1665 he retired into Buckinghamshire; but afterwards returned to Acton, where he staid till the act against conventicles expired; and then his audience was so large that he wanted room. Upon this he was committed to prison; but procuring an habeas corpus, he was discharged. After the indulgence in 1672, he returned to London; and in 1682 he was seized for coming within five miles of a corporation. In 1684 he was seized again; and in the reign of king James II. was committed prisoner to the king's bench, and tried before the lord chief justice Jefferies for his Paraphrase on the New Testament, which was called a *scandalous* and *seditionous* book against the government. He continued in prison two years; from whence he was at last discharged, and had his fine remitted by the king. He died December the 8th 1691; and was buried in Christ-Church.

Mr Sylvester says, that Mr Baxter's "person was tall and slender, and stooped much: his countenance composed and grave, somewhat inclining to smile. He had a piercing eye, a very articulate speech, and deportment rather plain than complimentary." There is an original portrait of him at Dr Williams's library, founded for the use of Protestant Dissenting Ministers, in Red-cross-street. Mr Sylvester also says, that "he had a great command over his thoughts. He had that happy faculty, so as to answer the character that was given of him by a learned man dissenting from him, after discourse with him; which was that *he could say what he would, and he could prove what he said*. He was most intent upon the necessary things. Rational learning he most valued, and was a very extraordinary master of. And as to his expressive faculty, he spoke properly, plainly, pertinently, and pathetically. He could speak suitably, both to mens capacities and to the things insisted on. He was a person wonderful at extemporate preaching." But his common practice appears to have been to preach with notes; though he said, "That he thought it very needful for a minister to have a body of divinity in his head." He was honoured with the friendship of some of the greatest and best men in the kingdom (as the Earl of Lauderdale, the Earl of Balcarras, Lord Chief Justice Hales, Dr Tillotson, &c.) and held correspondence with some of the most eminent foreign divines.—He wrote above 120 books, and had above 60 written against him. The former, however, it should seem, were greatly preferable to the latter; since Dr Barrow, an excellent judge, says,

Baxter.

Baxter. says, that "his practical writings were never mended, his controversial seldom confuted."

Mr Granger's character of him is too striking to be omitted. "Richard Baxter was a man famous for weakness of body and strength of mind; for having the strongest sense of religion himself, and exciting a sense of it in the thoughtless and profligate; for preaching more sermons, engaging in more controversies, and writing more books, than any other Nonconformist of his age. He spoke, disputed, and wrote with ease; and discovered the same intrepidity when he reproved Cromwell and expostulated with Charles II. as when he preached to a congregation of mechanics. His zeal for religion was extraordinary; but it seems never to have prompted him to faction, or carried him to enthusiasm. This champion of the Presbyterians was the common butt of men of every other religion, and of those who were of no religion at all. But this had very little effect upon him: his presence and his firmness of mind on no occasion forsook him. He was just the same man before he went into a prison, while he was in it, and when he came out of it; and he maintained an uniformity of character to the last gasp of his life. His enemies have placed him in hell; but every man who has not ten times the bigotry that Mr Baxter himself had, must conclude that he is in a better place. This is a very faint and imperfect sketch of Mr Baxter's character: men of his size are not to be drawn in miniature. His portrait, in full proportion, is in his *Narrative of his own Life and Times*; which though a rhapsody, composed in the manner of a diary, contains a great variety of memorable things, and is itself, as far as it goes, a History of Nonconformity."—Among his most famous works were, 1. *The Saints Everlasting Rest*. 2. *Call to the Unconverted*, of which 20,000 were sold in one year; and it was translated not only into all the European languages, but into the Indian tongue. 3. *Poor Man's Family Book*. 4. *Dying Thoughts*; and, 5. *A Paraphrase on the New Testament*. His practical works have been printed in four volumes folio.

BAXTER (William), nephew and heir to the former, was an eminent schoolmaster and critic. He was born at Lanugany in Shropshire, in the year 1650; and it is remarkable, that at the age of 18, when he first went to school, he knew not one letter nor understood one word of any language but Welsh; but he so well improved his time, that he became a person of great and extensive knowledge. His genius led him chiefly to the study of antiquities and philology, in which he composed several books. The first he published was a Grammar, in 1679, intitled *De Analogia seu Arte Latine Linguae Commentariolus*. He also published a new and correct edition of Anacreon, with notes; an edition of Horace; a Dictionary of the British antiquities, in Latin: and several other books. He was a great master of the ancient British and Irish tongues, was particularly skilled in the Latin and Greek, and in the northern and eastern languages. He died May 31. 1723, after being above 20 years master of Mercer's School in London.

BAXTER (Andrew), a very ingenious metaphysical writer, was born in 1686 or 1687, at Old Aberdeen (where his father was a merchant), and educated in King's College there. His principal employment was

that of a private tutor to young gentlemen; and among others of his pupils were Lord Grey, Lord Blantyre, and Mr Hay of Drummelzier. About 1724 he married the daughter of a clergyman in the shire of Berwick. A few years after he published in 4to, "An Inquiry into the Nature of the human Soul, wherein its immateriality is evinced from the principles of reason and philosophy;" without date. In 1741 he went abroad with Mr Hay, and resided some years at Utrecht; having there also Lord Blantyre under his care. He made excursions from thence into Flanders, France, and Germany; his wife and family residing, in the mean time, chiefly at Berwick-upon-Tweed. He returned to Scotland in 1747, and resided till his death at Whittingham, in the shire of East Lothian. He drew up, for the use of his pupils and his son, a piece intitled *Matho: sive, Cosmotheoria puerilis, Dialogus. In quo prima elementa de mundi ordine et ornatu proponuntur, &c.* This was afterwards greatly enlarged, and published in English, in two volumes 8vo. In 1750 was published, "An Appendix to his Inquiry into the Nature of the human Soul: wherein he endeavours to remove some difficulties which had been started against his notions of the *vis inertiae* of matter by Maclaurin, in his "Account of Sir Isaac Newton's Philosophical Discoveries." To this piece Mr Baxter prefixed a dedication to Mr John Wilkes, with whom he had commenced an acquaintance abroad. He died this year, April the 23d, after suffering for some months under a complication of disorders, of which the gout was the chief. He left a wife, three daughters, and one son, Mr Alexander Baxter; from which last the authors of Biographia Britannica received, as they inform us, sundry particulars of his life.

His learning and abilities are sufficiently displayed in his writings. He was extremely studious, and sometimes sat up whole nights in reading and writing. His temper at the same time was very cheerful, and he was a friend to innocent merriment. It is informed by his son, that he entered with much good humour into the conversation and pleasures of young people, when they were of an innocent nature: and that he presided, all the time of his abode at Utrecht, at the ordinary which was frequented by all the young English gentlemen there, with much gaiety and politeness, and in such a manner as gave universal satisfaction. He also frequented the most polite assemblies in that city, and his company and conversation were particularly acceptable to the ladies. So that Mr Baxter appears to have studied the graces, though without neglecting more valuable acquisitions and accomplishments. He was at once the scholar and the gentleman. In conversation he was modest, and not apt to make much show of the extensive knowledge of which he was possessed. In the discharge of the several social and relative duties of life, his conduct was exemplary. He had the most reverential sentiments of the Deity, of whose presence and immediate support he had always a strong impression upon his mind; and the general tenor of his life appears to have been conformable to the rules of virtue. Mr Baxter paid a strict attention to oeconomy, though he dressed elegantly, and was not parsimonious in his other expences. It is known also, that there were several occasions on which he acted with remarkable disinterestedness; and

Baxter.

Bay so far was he from courting preferment, that he has repeatedly declined considerable offers of that kind which were made him, if he would have taken orders in the church of England. The French, German, and Dutch languages were spoken by him with much ease, and the Italian tolerably; and he wrote and read them all, together with the Spanish. His friends and correspondents were numerous and respectable; and among them are particularly mentioned Mr Pointz, preceptor to the late Duke of Cumberland, and Dr Warburton, bishop of Gloucester. He was a man also of great benevolence and candour; which appears most strikingly from this, inasmuch as though Mr Wilkes had made himself so very obnoxious to the Scottish nation in general, yet Mr Baxter kept up with him an affectionate correspondence to the last, even after he was unable to write with his own hand. He left many manuscripts behind him; he would gladly have finished his work upon the human soul: "I own," says he, in a letter to Mr Wilkes, "if it had been the will of heaven, I would gladly have lived till I had put in order the second part of the Enquiry, showing the immortality of the human soul; but infinite Wisdom cannot be mistaken in calling me sooner. Our blindness makes us form wishes." It was indeed, what he considered it, his capital work: a second edition of it was published in two volumes 8vo in 1737, and a third in 1745. In another letter, speaking of his endeavours to establish the particular providence of the Deity, and to show his incessant influence and action on all the parts of matter, through the wide universe, from the inactivity of this dead substance; expresses his hope, that when the present party-zeal subsides a little, men will come more easily in to own such a plain truth. "His prediction," the editors of the *Biographia Britannica* observe, "hath not yet been accomplished. Several eminent names seem rather disposed to increase than to lessen the powers of matter; and they have expressly maintained that the soul of man is material. However, other names equally eminent have asserted the essential distinction between the mind and the body. Perhaps, in the revolutions of opinion, the doctrine of immateriality may again obtain the general suffrage of metaphysical and philosophical inquiry."

BAY, in geography, an arm of the sea shooting up into the land, and terminating in a nook. It is a kind of lesser gulph bigger than a creek, and is larger in its middle within than at its entrance. The largest and most noted bays in the world are those of Biscay, Bengal, Hudson's, Panama, &c.

BAY denotes likewise a pond-head made to keep in store of water for driving the wheels of the furnace or hammer belonging to an iron-mill, by the stream that comes thence through a flood-gate called the *pen stock*.

Bay-Colour denotes a sort of red inclining to chestnut, chiefly used in speaking of horses. In this sense, the word *bay* is formed from the Latin *baius*, or *badius*, and that from the Greek *βαῖος*, a palm branch; so that *badius* or *bay* properly denotes *color phaniceus*. Hence also, among the ancients, those now called *bay* horses, were denominated *equi palmati*. We have divers sorts and degrees of bays; as a light bay, a dapple bay, &c. All bay horses are said to have black manes; which distinguishes them from sorrels, which have red or white manes.

Bay, among huntsmen, is when the dogs have earthed a vermin, or brought a deer, boar, or the like, to turn head against them. In this case, not only the deer, but the dogs, are said to bay. It is dangerous going in to a hart at bay, especially at rutting-time; for then they are fiercest. There are bays at land, and others in the water.

Bay-Tree. See **LAURUS**.

Bay-Salt. See **SALT**.

BAYA, or **BAJA**, a town of Lower Hungary, in the county of Bath, situated near the Danube. E. Long. 19. 30. N. Lat. 46. 25.

BAYARD (Peter du Terrail de), esteemed by his contemporaries the model of soldiers and men of honour, and denominated *The knight without fear and without reproach*, was descended from an ancient and noble family in Dauphiné. He was with Charles VIII. at the conquest of the kingdom of Naples; where he gave remarkable proofs of his valour, especially at the battle of Fornoue. He was dangerously wounded at the taking of the city of Brescia; and there restored to the daughters of his host 2000 pistoles, which their mother had directed them to give him in order to prevent the house from being plundered; an action that has been celebrated by many historians. At his return to France, he was made lieutenant-general of Dauphiné. He fought by the side of Francis I. at the battle of Marignan; and that prince afterwards insisted on being knighted by his hand, after the manner of the ancient knights. The chevalier Bayard defended Meziéres during six weeks, against Charles V.'s army. In 1524, at the retreat of Rebec † (the general Bonivet having been wounded and obliged to quit the field, the conduct of the rear was committed to the chevalier Bayard, who, though so much a stranger to the arts of a court that he never rose to the chief command, was always called, in times of real danger, to the posts of greatest difficulty and importance. He put himself at the head of the men at arms; and animating them by his presence and example to sustain the whole shock of the enemy's troops, he gained time for the rest of his countrymen to make good their retreat. But in this service he received a wound which he immediately perceived to be mortal; and being unable to continue any longer on horseback, he ordered one of his attendants to place him under a tree, with his face towards the enemy; then fixing his eyes on the guard of his sword, which he held up instead of a cross, he addressed his prayers to God; and in this posture, which became his character both as a soldier and as a Christian, he calmly waited the approach of death. Bourbon, who led the foremost of the enemy's troops, found him in this situation, and expressed regret and pity at the sight. "Pity not me," cried the high-spirited chevalier, "I die as a man of honour ought, in the discharge of my duty: they indeed are objects of pity, who fight against their king, their country, and their oath." The marquis de Pescara, passing soon after, manifested his admiration of Bayard's virtue, as well as his sorrow for his fate, with the generosity of a gallant enemy; and finding that he could not be removed with safety from that spot, ordered a tent to be pitched there, and appointed proper persons to attend him. He died, notwithstanding their care, as his ancestors for several generations had done, in the field of battle. Pescara ordered

Bay
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Bayard.

† *Hist. of Charles V.*
Book iii.

Bayeux,
Bayle.

ordered his body to be embalmed, and sent to his relations; and such was the respect paid to military merit in that age, that the duke of Savoy commanded it to be received with royal honours in all the cities of his dominions: in Dauphiné, Bayard's native country, the people of all ranks came out in a solemn procession to meet it.

BAYEUX, a considerable town of France in Normandy and capital of Bessin, with a rich bishop's see. The cathedral church is accounted the finest in that province; and its front and three high steeples are said to be the best in France. W. Long. o. 33. N. Lat. 49. 16.

BAYLE (Peter), author of the Historical and Critical Dictionary, was born November 18th 1657, at Carla, a village in the county of Foix, in France, where his father John Bayle was a Protestant minister. In 1666, he went to the Protestant university at Puy-laureus, where he studied with the greatest application; and in 1669, removed to the university of Toulouse, whither the Protestants at that time frequently sent their children to study under the Jesuits: but here, to the great grief of his father, he embraced the Romish religion; however, being soon sensible of his error, he left that university, and went to study at Geneva. After which he was chosen professor of philosophy at Sedan: but that Protestant university being suppressed by Louis XIV. in 1681, he was obliged to leave the city; and was soon after chosen professor of philosophy and history at Rotterdam, with a salary of about L. 45. a-year. The year following he published his Letter concerning Comets. And Father Maimbourg having published about this time his History of Calvinism, wherein he endeavours to draw upon the Protestants the contempt and resentment of the Catholics, Mr Bayle wrote a piece to confute his history. The reputation which he had now acquired, induced the States of Friezland, in 1684, to offer him a professorship in their university; but he wrote them a letter of thanks, and declined the offer. This same year he began to publish his *Nouvelles de la republique des lettres*.

In 1686, he was drawn into a dispute in relation to the famous Christina queen of Sweden. In his Journal for April, he took notice of a printed letter, supposed to have been written by her Swedish majesty to the chevalier de Terlon, wherein she condemns the persecution of the Protestants in France. He inserted the letter itself in his Journal for May; and in that of June following he says, "What we hinted at in our last month, is confirmed to us from day to day, that Christina is the real author of the letter concerning the persecutions in France, which is ascribed to her: it is a remainder of Protestantism." Mr Bayle received an anonymous letter; the author of which says, that he wrote to him of his own accord, being in duty bound to it as a servant of the queen. He complains that Mr Bayle, speaking of her majesty, called her only *Christina*, without any title; he finds also great fault with his calling the letter "a remainder of Protestantism." He blames him likewise for inserting the words "I am," in the conclusion of the letter. "These words (says this anonymous writer) are not her majesty's; a queen, as she is, cannot employ these words but with regard to a very few persons, and Mr de Ter-

lon is not of that number." Mr Bayle wrote a vindication of himself as to these particulars, with which the author of the anonymous letter declared himself satisfied, excepting what related to "the remainder of Protestantism." He would not admit of the defence with regard to that expression; and in another letter, advised him to retract that expression. He adds in a postscript, "You mention, in your Journal of August, a second letter of the queen, which you scruple to publish. Her majesty would be glad to see that letter; and you will do a thing agreeable to her if you would send it to her. You might take this opportunity of writing to her majesty. This counsel may be of some use to you; do not neglect it." Mr Bayle took the hint, and wrote a letter to her majesty, dated the 14th of November 1686; to which the queen, on the 14th of December, wrote the following answer:—"Mr Bayle, I have received your excuses; and am willing you should know by this letter, that I am satisfied with them. I am obliged to the zeal of the person who gave you occasion of writing to me: for I am very glad to know you. You express so much respect and affection for me, that I pardon you sincerely; and I would have you know, that nothing gave me offence but that *remainder of Protestantism*, of which you accused me. I am very delicate on that head, because nobody can suspect me of it, without lessening my glory, and injuring me in the most sensible manner. You would do well if you should even acquaint the public with the mistake you have made, and with your regret for it. This is all that remains to be done by you, in order to deserve my being entirely satisfied with you. As to the letter which you have sent me, it is mine without doubt; and since you tell me that it is printed, you will do me a pleasure if you send me some copies of it. As I fear nothing in France, so neither do I fear any thing at Rome. My fortune, my blood, and even my life, are entirely devoted to the service of the church; but I flatter nobody, and will never speak any thing but the truth. I am obliged to those who have been pleased to publish my letter, for I do not at all disguise my sentiments. I thank God, they are too noble and too honourable to be disowned. However, it is not true that this letter was written to one of my ministers. As I have every where enemies and persons who envy me, so in all places I have friends and servants: and I have possibly as many in France, notwithstanding of the court, as any where in the world. This is purely the truth, and you may regulate yourself accordingly. But you shall not get off so cheap as you imagine. I will enjoin you a penance; which is, that you will henceforth take the trouble of sending me all curious books that shall be published in Latin, French, Spanish, or Italian, on whatever subject or science, provided they are worthy of being looked into; I do not even except romances or satires; and above all, if there are any books of chemistry, I desire you may send them to me as soon as possible. Do not forget likewise to send me your Journal. I shall order that you be paid for whatever you lay out, do but send me an account of it. This will be the most agreeable and most important service that can be done me. May God prosper you.

CHRISTINA ALEXANDRA."

It now only remained that Mr Bayle should acquaint the public with the mistake he had made, in order to merit

Bayle.

Bayle. merit that prince's entire satisfaction; and this he did in the beginning of his Journal of the month of January, 1687.

The persecution which the Protestants at this time suffered in France, affected Mr Bayle extremely. He made occasionally some reflections on their sufferings in his Journal; and he wrote a pamphlet also on the subject. Some time afterwards he published his *Commentaire Philosophique* upon these words, "Compel them to come in:" but the great application he gave to this and his other works, threw him into a fit of sickness, which obliged him to discontinue his Literary Journal. Being advised to try a change of air, he left Rotterdam on the 8th of August, and went to Cleves; whence after having continued some time, he removed to Aix-la-Chapelle, and from thence returned to Rotterdam on the 18th of October. In the year 1690, the famous book, intitled, *Avis aux Refugiez*, &c. made its appearance. Mr Jurieu, who took Mr Bayle for the author thereof, wrote a piece against it; and he prefixed an advice to the public, wherein he calls Mr Bayle a profane person, and a traitor engaged in a conspiracy against the state. As soon as Mr Bayle had read this libel against him, he went to the grand Schout of Rotterdam, and offered to go to prison, provided his accuser would accompany him, and undergo the punishment he deserved if the accusation was found unjust. He published also an answer to Mr Jurieu's charge; and as his reputation, nay his very life, was at stake in case the accusation of treason was proved, he therefore thought himself not obliged to keep any terms with his accuser, and attacked him with the utmost severity. Mr Jurieu lost all patience: he applied himself to the magistrates of Amsterdam; who advised him to a reconciliation with Mr Bayle, and enjoined them not to publish any thing against each other till it was examined by Mr Boyer, the pensioner of Rotterdam. But notwithstanding this prohibition, Mr Jurieu attacked Mr Bayle again with so much passion, that he forced him to write a new vindication of himself.

In November 1690, Mr de Beauval advertised in his Journal, *A scheme for a Critical Dictionary*. This was the work of Mr Bayle. The articles of the three first letters of the alphabet were already prepared; but a dispute happening betwixt him and Mr de Beauval, obliged him for some time to lay aside the work. Nor did he resume it till May 1692, when he published his scheme: but the public not approving of his plan, he threw it into a different form; and the first volume was published in August 1695, and the second in October following. The work was extremely well received by the public; but it engaged him in fresh disputes, particularly with Mr Jurieu and the abbe Renaudot. Mr Jurieu published a piece, wherein he endeavoured to engage the ecclesiastical assemblies to condemn the dictionary; he presented it to the senate sitting at Delft, but they took no notice of the affair. The consistory of Rotterdam granted Mr Bayle a hearing; and after having heard his answers to their remarks on his dictionary, declared themselves satisfied, and advised him to communicate this to the public. Mr Jurieu made another attempt with the consistory in 1698; and so far he prevailed with them, that they exhorted Mr Bayle to be more cautious with regard to his principles in the second edition of his dictionary; which was

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published in 1702, with many additions and improvements.

Mr Bayle was a most laborious and indefatigable writer. In one of his letters to Mazieux, he says, that since his 20th year he hardly remembers to have had any leisure. His intense application contributed perhaps to impair his constitution, for it soon began to decline. He had a decay of the lungs, which weakened him considerably; and as this was a distemper which had cut off several of his family, he judged it to be mortal, and would take no remedies. He died the 28th of December 1706, after he had been writing the greatest part of the day. He wrote several books besides what we have mentioned, many of which were in his own defence against attacks he had received from the abbe Renaudot, Mr Clerk, M. Jaquelot, and others. Among the productions which do honour to the age of Louis XIV. Mr Voltaire has not omitted the Critical Dictionary of our author: "It is the first work of the kind (he says) in which a man may learn to think." He censures indeed those articles which contain only a detail of minute facts, as unworthy either of Bayle, an understanding reader, or posterity. "In placing him (continues the same author) amongst the writers who do honour to the age of Louis XIV. notwithstanding his being a refugee in Holland, I only conform to the decree of the parliament of Thoulouse, which, when it declared his will valid in France, notwithstanding the rigour of the laws, expressly said, *that such a man could not be considered as a foreigner*."

BAYLY (Lewis), author of that most memorable book, intitled, *The Practice of Piety*. He was born at Caermarthen in Wales, educated at Oxford, made minister of Evesham in Worcestershire about 1611, became chaplain to king James, and promoted to the see of Bangor in 1616. His book is dedicated to the high and mighty prince, Charles prince of Wales; and the author tells his highness, that "he had endeavoured to extract out of the chaos of endless controversies the old practice of true piety, which flourished before these controversies were hatched." The design was good; and the reception this book has met with may be known from the number of its editions, that in 8vo, 1734, being the fifty-ninth. This prelate died in 1632.

BAYON, a town of France, in Lorrain, seated on the river Moselle. E. Long. 14. 42. N. Lat. 48. 30.

BAYON, or *Bayona*, a town of Galicia, in Spain, seated on a small gulph of the Atlantic ocean, about 12 miles from Tuy. It has a very commodious harbour, and the country about it is fertile. W. Long. 9. 30. N. Lat. 43. 3.

BAYONET, in the military art, a short broad dagger, formerly with a round handle fitted for the bore of a firelock, to be fixed there after the soldier had fired; but they are now made with iron handles and rings, that go over the muzzle of the firelock, and are screwed fast, so that the soldier fires with his bayonet on the muzzle of his piece, and is ready to act against the horse. This use of the bayonet fastened on the muzzle of the firelock was a great improvement, first introduced by the French, and to which, according to M. Folard, they owed a great part of their victories in the last century; and to the neglect of this in the next

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Bayonne,
Bays.

succeeding war, and trusting to their fire, the same author attributes most of the losses they sustained. At the siege of Malta, a weapon called *pila ignea* was contrived to oppose the bayonets, being in some measure the converse thereof; as the latter consists of a dagger added to a fire-arm, the former consisted of a fire-arm added to a pilum or pike.

Of late the bayonet has come into very general use; and battles have been won by it without firing a shot. This way of fighting was chiefly restored by the late king of Prussia, who made his troops rush forward at once with bayonets on the enemy.

BAYONNE, a city of Gascony, in France; seated near the mouth of the river Adour, which forms a good harbour. It is moderately large, and of great importance. It is divided into three parts. The great town is on this side the river Nive: the little town is between the Nive and the Adour; and the suburbs of Saint Esprit is beyond this last river. Both the former are surrounded with an old wall and a dry ditch, and there is a small castle in each. That of Great Bayonne is flanked with four round towers, and is the place where the governor resides. The new castle is flanked with four towers, in the form of bastions. The first inclosure is covered with another, composed of eight bastions, with a great horn-work, and a half-moon; all which are encompassed with a ditch, and a covered way. There is a communication between the city and the suburbs by a bridge, and the suburbs is well fortified. The citadel is seated beyond the Adour, on the side of the suburbs abovementioned. The public buildings have nothing remarkable; it is the only city in the kingdom that has the advantage of two rivers, wherein the tide ebbs and flows. The river Nive is deeper than the Adour, but less rapid, by which means ships come up into the middle of the city. There are two bridges over this river, by which the old and new town communicate with each other. The trade of this town is the more considerable, on account of its neighbourhood to Spain, and the great quantity of wines which are brought hither from the adjacent country. The Dutch carry off a great number of pipes in exchange for spices and other commodities, which they bring thither. The inhabitants have the privilege of guarding two of their three gates, and the third is kept by the king. W. Long. 1. 20. N. Lat. 43. 20.

BAYS, in commerce, a sort of open woollen stuff, having a long nap, sometimes frized, and sometimes not. This stuff is without wale; and is wrought in a loom with two treddles, like flannel. It is chiefly manufactured at Colchester and Bockin in Essex, where there is a hall called the *Duch-bay hall*, or *raw-hall*. This manufacture was first introduced into England, with that of says, sarges, &c. by the Flemings; who being persecuted by the duke of Alva for their religion, fled thither about the fifth of Queen Elizabeth's reign; and had afterwards peculiar privileges granted them by act of parliament 12 Charles II. 1660, which the bays-makers in the above places still enjoy.—The exportation of bays was formerly much more considerable than at present when the French have learned to imitate them. However, the English bays are still sent in great quantities to Spain and Portugal, and even to Italy. Their chief use is for dressing the monks and nuns, and for linings, especially in the ar-

my. The looking-glass makers also use them behind their glasses, to preserve the tin or quicksilver; and the casemakers, to line their cases. The breadth of bays is commonly a yard and a half, a yard and three quarters, or two yards, by 42 to 48 in length. Those of a yard and three quarters are most proper for the Spanish trade.

BAZADOIS, a province of Guienne in France, which makes part of Lower Gascony. It is a barren heathy country. Its capital is Bazas.

BAZAR, or BASAR, a denomination among the Turks and Persians, given to a kind of exchanges, or places where their finest stuffs and other wares are sold. These are also called *bexessins*. The word *bazar* seems of Arabic origin, where it denotes sale, or exchange of goods. Some of the eastern bazars are open, like the market-places in Europe, and serve for the same uses, more particularly for the sale of the bulky and less valuable commodities. Others are covered with lofty ceilings, or even domes, pierced to give light; and it is in these the jewellers, goldsmiths, and other dealers in the richer wares, have their shops. The bazar or maidan of Ispahan is one of the finest places in Persia, and even surpasses all the exchanges in Europe; yet, notwithstanding its magnificence, it is excelled by the bazar of Tauris, which is the largest that is known, having several times held 30,000 men ranged in order of battle. At Constantinople, there is the old and the new bazar, which are large square buildings, covered with domes, and sustained by arches and pilastres; the former chiefly for arms, harnesses, and the like; the latter for goldsmiths, jewellers, furriers, and all sorts of manufacturers.

BAZAS, a town of Guienne in France, capital of the Bazadois, with a bishop's see. It is built on a rock, in W. Long. 0. 30. N. Lat. 44. 20.

BAZAT, or BAZA, in commerce, a long, fine, spun cotton, which comes from Jerusalem, whence it is also called *Jerusalem-cotton*.

BAZGENDGES, in natural history, the name of a substance used by the Turks and other eastern nations in their scarlet-dying. They mix it for this purpose with cochineal and tartar; the proportions being two ounces of the bazgendges to one ounce of cochineal. These are generally esteemed a sort of fruit, and are produced on certain trees in Syria and other places; and it is usually supposed, that the scarcity and dearness of them is the only thing that makes them not used in Europe. But the bazgendges seem to be no other than the horns of the turpentine-tree in the eastern parts of the world; and it is not only in Syria that they are found, but China also affords them. Many things of this kind were sent over to Mr Geoffroy at Paris from China as the substances used in the scarlet-dying of that country, and they all proved wholly the same with the Syrian and Turkish bazgendges, and with the common turpentine horns. The lentisk, or mastic-tree, is also frequently found producing many horns of a like kind with these, and of the same origin, all being owing to the pucerons, which make their way into the leaves to breed their young there.

BDELLIUM, a gummy resinous juice, produced by a tree in the East Indies, of which we have no satisfactory account. It is brought into Europe both from the East Indies and Arabia. It is in pieces of different

Bazadois
Bdelium.

Beachy
||
Bead.

different sizes and figures, externally of a dark reddish brown, somewhat like myrrh; internally it is clear, and not unlike to glue; to the taste it is slightly bitterish and pungent; its odour is very agreeable. If held in the mouth, it soon becomes soft and tenacious, sticking to the teeth. Laid on a red-hot iron, it readily catches flame, and burns with a crackling noise, and in proportion to its goodness it is more or less fragrant. Near half of its substance dissolves either in water or in spirit of wine; but the tincture made with spirit is somewhat stronger, and by much more agreeable. Vinegar, or verjuice, dissolves it wholly. The simple gum is a better medicine than any preparation from it. It is one of the weakest of the deobstruent gums, but it is used as a pectoral and an emmenagogue.

BEACHY-HEAD, a promontory on the coast of Sussex, between Hastings and Shoreham, where the French defeated the English and Dutch fleet in 1690.

BEACON, a signal for the better securing the kingdom from foreign invasions. See SIGNAL.

On certain eminent places of the country are placed long poles erect, whereon are fastened pitch-barrels to be fired by night, and smoke made by day, to give notice in a few hours to the whole kingdom of an approaching invasion. These are commonly called *beacons*; whence also comes *beaconage*.—We find beacons familiarly in use among the primitive Britons and Western Highlanders. The besieged capital of one of our northern isles in the third century actually lighted up a fire upon a tower; and Fingal instantly knew “the green flame edged with smoke” to be a token of attack and distress*. And there are to this day several cairns or heaps of stones upon the heights along the coasts of the Harries, on which the inhabitants used to burn heath as a signal of an approaching enemy.

BEACONS are also marks and signs erected on the coasts, for guiding and preserving vessels at sea, by night as well as by day.

The erection of beacons, light-houses, and sea-marks, is a branch of the royal prerogative. The king hath the exclusive power, by commission under his great seal, to cause them to be erected in fit and convenient places, as well upon the lands of the subject as upon the demesnes of the crown: which power is usually vested by letters patent in the office of lord high admiral. And by statute 8 Elib. c. 13. the corporation of the trinity-house are impowered to set up any beacons or sea-marks wherever they shall think them necessary; and if the owner of the land or any other person shall destroy them, or shall take down any steeple, tree, or other known sea-mark, he shall forfeit 100 l. or, in case of inability to pay it, shall be *ipso facto* outlawed.

BEACONAGE, money paid towards the maintenance of a beacon. See BEACON.—The word is derived from the Saxon *beacnian*, to nod, or show by a sign; hence also the word *beckon*.

BEACONSFIELD, a town of Buckinghamshire in England, seated on a hill in the road between London and Oxford. It has several good inns, though not above 100 houses. W. Long. o. 25. N. Lat. 51. 36.

BEAD, a small globule or ball used in necklaces; and made of different materials, as pearl, steel, garnet, coral, diamond, amber, crystal, pates, glass, &c.—The Romanists make great use of beads in rehearsing

their *Ave-Marias* and *Pater-nosters*; and the like usage is found among the dervises and other religious throughout the East, as well Mahometan as Heathen. The ancient Druids appear also to have had their beads, many of which are still found; at least, if the conjecture of an ingenious author may be admitted, who takes those antique glass globules, having a snake painted round them, and called *adder-beads*, or *snake-buttons*, to have been the beads of our ancient Druids. See ANGUIS.

BEADS are also used in speaking of those glass globules vended to the savages on the coast of Africa; thus denominated because they are strung together for the convenience of traffic.

The common black glass of which beads are made for necklaces, &c. is coloured with manganese only: one part of manganese is sufficient to give a black colour to near twenty of glass.

BEAD, in architecture, a round moulding, commonly made upon the edge of a piece of stuff, in the Corinthian and Roman orders, cut or carved in short embossments, like beads in necklaces.

BEAD-Makers, called by the French *paternostriers*, are those employed in the making, stringing, and selling of beads. At Paris there are three companies of paternostriers, or bead-makers; one who make them of glass or crystal; another in wood and horn; and the third in amber, coral, jet, &c.

BEAD-Proof, a term used by our distillers to express that sort of proof of the standard strength of spirituous liquors, which consists in their having, when shaken in a phial, or poured from on high into a glass, a crown of bubbles, which stand on the surface some time after. This is esteemed a proof that the spirit consists of equal parts of rectified spirits and phlegm. This is a fallacious rule as to the degree of strength in the goods; because any thing that will increase the tenacity of the spirit, will give it this proof, though it be under the due strength. Our malt-distillers spoil the greater part of their goods, by leaving too much of the stinking oil of the malt in their spirit, in order to give it this proof when somewhat under the standard strength. But this is a great deceit on the purchasers of malt spirits, as they have them by this means not only weaker than they ought to be, but stinking with an oil that they are not easily cleared of afterwards. On the other hand, the dealers in brandy, who usually have the art of sophisticating it to a great nicety, are in the right when they buy it by the strongest bead-proof, as the grand mark of the best; for being a proof of the brandy containing a large quantity of its oil, it is, at the same time, a token of its high flavour, and of its being capable of bearing a very large addition of the common spirits of our own produce, without betraying their flavour, or losing its own. We value the French brandy for the quantity of this essential oil of the grape which it contains; and that with good reason, as it is with us principally used for drinking as an agreeably flavoured cordial: but the French themselves, when they want it for any curious purposes, are as careful in the rectifications of it, and take as much pains to clear it from this oil, as we do to free our malt spirit from that nauseous and fetid oil which it originally contains.

BEAD-Roll, among Papists, a list of such persons, for the rest of whose souls they are obliged to repeat a cer-

Beads.

* *Offian*,
vol. I. p.
198.

Beadle
||
Beam.

tain number of prayers, which they count by means of their beads.

BEAD-Tree. See MELIA.

BEADLE (from the Saxon *bydel*, a messenger), a crier or messenger of a court, who cites persons to appear and answer. Called also a *summoner* or *apparitor*. — *Beadle* is also an officer at an university, whose chief business is to walk before the masters with a mace, at all public processions. — There are also *church-beadles*, whose office is well known.

BEAGLES, a small sort of hounds or hunting dogs. Beagles are of divers kinds; as the *southern beagle*, something less and shorter, but thicker, than the deep-mouthed hound; the *fleet northern*, or *cat beagle*, smaller, and of a finer shape than the southern, and a harder runner. From the two, by crossing the strains, is bred a third sort held preferable to either. To these may be added a still smaller sort of beagles, scarce bigger than lap-dogs, which make pretty diversion in hunting the coney, or even small hare in dry weather; but otherwise unserviceable, by reason of their size.

BEAK, the bill or nib of a bird. See ORNITHOLOGY.

BEAK, or *Beak head*, of a ship, that part without the ship, before the fore-castle, which is fastened to the stem, and is supported by the main knee.

The beak, called by the Greeks *μυζολον*, by the Latins *rostrum*, was an important part in the ancient ships of war, which were hence denominated *naves rostratae*. The beak was made of wood; but fortified with brass, and fastened to the prow, serving to annoy the enemies vessels. Its invention is attributed to Pisæus an Italian. The first beaks were made long and high; but afterwards a Corinthian, named *Aristo*, contributed to make them short and strong, and placed so low, as to pierce the enemies vessels under water. By the help of these great havock was made by the Syracusians in the Athenian fleet.

BEAKED, in heraldry, a term used to express the beak or bill of a bird. When the beak and legs of a fowl are of a different tincture from the body, we say *beaked and membered of such a tincture*.

BEALE (Mary), particularly distinguished by her skill in painting, was the daughter of Mr Craddock, minister of Waltham upon Thames, and learned the rudiments of her art from Sir Peter Lely. She painted in oil, water-colours, and crayons, and had much business; her portraits were in the Italian style, which she acquired by copying pictures and drawings from Sir Peter Lely's and the royal collections. Her master, says Mr Walpole, was supposed to have had a tender attachment to her; but as he was reserved in communicating to her all the resources of his pencil, it probably was a gallant rather than a successful one. Dr Woodfall wrote several pieces to her honour, under the name of *Belesia*. Mrs Beale died in Pall-mall, on the 28th of Dec. 1697, aged 65. Her paintings have much nature, but the colouring is stiff and heavy.

BEALT, **BEALTH**, or *Builtb*, a town of Brecknockshire in South Wales, pleasantly seated on the river Wye. It consists of about 100 houses, whose inhabitants have a trade in stockings. W. Long. 4. 10. N. Lat. 52. 4.

BEAM, in architecture, the largest piece of wood in a building, which lies cross the walls, and serves to

support the principal rafters of the roof, and into which the feet of these rafters are framed. No building has less than two of these beams, viz. one at each end; and into these the girders of the garret roof are also framed. The proportion of beams in or near London, are fixed by statute, as follows; a beam 15 feet long, must be 7 inches on one side its square, and 5 on the other; if it be 16 feet long, one side must be 8 inches, the other 6, and so proportionably to their lengths. In the country, where wood is more plenty, they usually make their beams stronger.

BEAMS of a Ship are the great main cross-timbers which hold the sides of the ship from falling together, and which also support the decks and orlops: the main beam is next the main-mast, and from it they are reckoned by first, second, third beam, &c. the greatest beam of all is called the *midship beam*.

BEAM Compass, an instrument consisting of a square wooden or brass beam, having sliding sockets, that carry steel or pencil points; they are used for describing large circles, where the common compasses are useless.

BEAM-Bird, or *Petty chaps*. See MOTACILLA.

BEAM also denotes the lath, or iron, of a pair of scales; sometimes the whole apparatus for weighing of goods is so called: Thus we say, it weighs so much at the king's beam.

BEAM of a Plough, that in which all the parts of the plough-tail are fixed. See AGRICULTURE, n° 83, &c.

BEAM, or *Roller*, among weavers, a long and thick wooden cylinder, placed lengthwise on the back-part of the loom of those who work with a shuttle. That cylinder, on which the stuff is rolled as it is weaved, is also called the *beam* or *roller*, and is placed on the fore-part of the loom.

BEAMINSTER, a town of Dorsetshire in England, seated on the river Bert, in W. Long. 2. 50. N. Lat. 52. 45.

BEAN, in botany. See VICIA.

The ancients made use of beans in gathering the votes of the people, and for the election of magistrates. A white bean signified *absolution*, and a black one *condemnation*. Beans had a mysterious use in the *lemuralia* and *parentalia*; where the master of the family, after washing, was to throw a sort of black beans over his head, still repeating the words, "I redeem myself and family by these beans." Ovid * gives * *Fast. lib. 5.* a lively description of the whole ceremony in verse. — v. 435.

Abstinence from beans was enjoined by Pythagoras, one of whose symbols is, *κυμαων αποχισθαι* *abstine a fabis*. The Egyptian priests held it a crime to look at beans, judging the very sight unclean. The *flamen dialis* was not permitted even to mention the name. The precept of Pythagoras has been variously interpreted: some understand it of forbearing to meddle in trials and verdicts, which were then by throwing beans into an urn: others, building on the equivocal of the word *κυμαω*, which equally signifies a *barn* and a human *testicle*, explain it by abstaining from venery. Clemens Alexandrinus grounds the abstinence from beans on this, that they render women barren; which is confirmed by Theophrastus, who extends the effect even to plants. Cicero suggests another reason for this abstinence, viz. that beans are great enemies to tranquillity of mind. For a reason of this kind it is, that Amphiarus is said

Beam
||
Bean.

Beans to have abstained from beans, even before Pythagoras, that he might enjoy a clearer divination by dreams.

BEANS, as food for horses. See FARRIERY, § i. 6.

BEAN-Caper. See ZYGOPHYLLUM.

BEAN-Cod, a small fishing vessel or pilot-boat, common on the sea-coast and in the rivers of Portugal. It is extremely sharp forward, having its stem bent inward above into a great curve: the stem is also plated on the fore-side with iron, into which a number of bolts are driven, to fortify it, and resist the stroke of another vessel, which may fall athwart-haue. It is commonly navigated with a large lateen sail, which extends over the whole length of the deck, and is accordingly well fitted to ply to windward.

BEAN-Flour, called by the Romans *lomentum*, was of some repute among the ancient ladies as a cosmetic, wherewith to smooth the skin, and take away wrinkles.

BEAN-Fly, in natural history, the name given by authors to a very beautiful fly, of a pale purple colour, frequently found on bean-flowers. It is produced from the worm or maggot called by authors *mida*.

BEAN-Goose, in ornithology. See ANAS.

Kidney-BEAN. See PHASEOLUS.

Malacca-BEANS, or *Anacardia*, the fruit of a tree growing in Malabar and other parts of the East Indies, supposed by some to be the *AVICENNIA tomentosa*; by others, the *BONTIA germinans*. The fruit is of a shining black colour, of the shape of a heart flattened, about an inch long, terminating at one end in an obtuse point, and adhering by the other to a wrinkled stalk: it contains within two shells a kernel of a sweetish taste: betwixt the shells is lodged a thick and acrid juice.

The medicinal virtues of *anacardia* have been greatly disputed. Many have attributed to them the faculty of comforting the brain and nerves, fortifying the memory, and quickening the intellect: and hence a confection made from them has been dignified with the title of *confectio sapientum*; others think it better deserves the name of *confectio stultorum*, and mention instances of its continued use having rendered people maniacal. But the kernel of *anacardium* is not different in quality from that of almonds. The ill effects attributed to this fruit belong only to the juice contained betwixt the kernels, whose acrimony is so great, that it is said to be employed by the Indians as a caustic. This juice is recommended externally for tetters, freckles, and other cutaneous deformities; which it removes only by excruciating or excoriating the part, so that a new skin comes underneath.

BEAR, in zoology. See URSUS.

Sea-BEAR. See PHOCA.

BEAR, in astronomy. See Ursa.

Order of the BEAR was a military order in Switzerland, erected by the Emperor Frederick II. in 1213, by way of acknowledgment for the service the Swiss had done him, and in favour of the abbey of St Gaul. To the collar of the order hung a medal, on which was represented a bear raised on an eminence of earth.

BEAR'S-Breech, in botany. See ACANTHUS.

BEAR'S Flesh was much esteemed by the ancients: even at this day, the paw of a bear salted and smoked is served up at the table of princes.

BEAR'S Grease, was formerly esteemed a sovereign

remedy against cold disorders, especially rheumatisms. It is now much used in dressing ladies and gentlemen's hair.

BEAR'S Skin makes a fur in great esteem, and on which depends a considerable article of commerce, being used in housings, on coach-boxes, &c. In some countries, clothes are made of it, more especially bags wherein to keep the feet warm in severe colds. Of the skins of bears cubs are made gloves, muffs, and the like.

BEARALSTON, a poor town of Devonshire, which, however, is a borough by prescription, and sends two members to parliament.

BEARD, the hair growing on the chin and adjacent parts of the face, chiefly of adults and males.

Various have been the ceremonies and customs of most nations in regard of the beard. The Tartars, out of a religious principle, waged a long and bloody war with the Persians, declaring them infidels, merely because they would not cut their whiskers after the rite of Tartary: and we find, that a considerable branch of the religion of the ancients consisted in the management of their beard. The Greeks wore their beards till the time of Alexander the Great; that prince having ordered the Macedonians to be shaved, for fear it should give a handle to their enemies. According to Pliny, the Romans did not begin to shave till the year of Rome 454, when P. Ticinius brought over a stock of barbers from Sicily.—Persons of quality had their children shaved the first time by others of the same or greater quality, who, by this means, became god-father or adoptive father of the children. Anciently, indeed, a person became god-father of the child by barely touching his beard: thus historians relate, that one of the articles of the treaty between Alaric and Clovis was, that Alaric should touch the beard of Clovis to become his god-father.

As to ecclesiastics, the discipline has been very different on the article of beards: sometimes they have been enjoined to wear them, from a notion of too much effeminacy in shaving, and that a long beard was more suitable to the ecclesiastical gravity; and sometimes again they were forbid it, as imagining pride to lurk beneath a venerable beard. The Greek and Roman churches have been long together by the ears about their beards: since the time of their separation, the Romanists seem to have given more into the practice of shaving, by way of opposition to the Greeks; and have even made some express constitutions *de radendis barbis*. The Greeks, on the contrary, espouse very zealously the cause of long beards, and are extremely scandalized at the beardless images of saints in the Roman churches. By the statues of some monasteries it appears, that the lay-monks were to let their beards grow, and the priests among them to shave; and that the beards of all that were received into the monasteries, were blessed with a great deal of ceremony. There are still extant the prayers used in the solemnity of consecrating the beard to God, when an ecclesiastic was shaven.

Le Comte observes, that the Chinese affect long beards extravagantly; but nature has balked them, and only given them very little ones, which, however, they cultivate with infinite care: the Europeans are strangely envied by them on this account, and esteemed the greatest men in the world. Chrysostom observes, that the kings of Persia had their beards wove or matted together.

Bear
Beard.

Beard.

gether with gold-thread; and some of the first kings of France had their beards knotted and buttoned with gold.

Among the Turks, it is more infamous for any one to have his beard cut off, than among us to be publicly whipt or branded with a hot iron. There are abundance in that country, who would prefer death to this kind of punishment. The Arabs make the preservation of their beards a capital point of religion, because Mahomet never cut his. Hence the razor is never drawn over the Grand Signior's face. The Persians, who clip them, and shave above the jaw, are reputed heretics. It is likewise a mark of authority and liberty among them, as well as among the Turks. They who serve in the seraglio, have their beards shaven, as a sign of their servitude. They do not suffer it to grow till the sultan has set them at liberty, which is bestowed as a reward upon them, and is always accompanied with some employment.

The most celebrated ancient writers, and several modern ones, have spoken honourably of the fine beards of antiquity. Homer speaks highly of the white beard of Nestor and that of old king Priam. Virgil describes Mezentius's to us, which was so thick and long as to cover all his breast; Chrysippus praises the noble beard of Timothy, a famous player on the flute. Pliny the younger tells us of the white beard of Euphrates, a Syrian philosopher; and he takes pleasure in relating the respect mixed with fear with which it inspired the people. Plutarch speaks of the long white beard of an old Laconian, who, being asked why he let it grow so, replied, 'Tis that, seeing continually my white beard, I may do nothing unworthy of its whiteness. Strabo relates, that the Indian philosophers, the Gymnosophists, were particularly attentive to make the length of their beards contribute to captivate the veneration of the people. Diodorus, after him, gives a very particular and circumstantial history of the beards of the Indians. Juvenal does not forget that of Antiochus the son of Nestor. Fenelon, in describing a priest of Apollo in all his magnificence, tells us, that he had a white beard down to his girdle. But Persius seems to outdo all these authors: this poet was so convinced that a beard was the symbol of wisdom, that he thought he could not bestow a greater encomium on the divine Socrates, than by calling him the bearded master, *Magistrum barbatum*.

While the Gauls were under their sovereignty, none but the nobles and Christian priests were permitted to wear long beards. The Franks having made themselves masters of Gaul, assumed the same authority as the Romans: the bondsmen were expressly ordered to shave their chins; and this law continued in force until the entire abolishment of servitude in France. So likewise, in the time of the first race of kings, a long beard was a sign of nobility and freedom. The kings, as being the highest nobles in their kingdom, were emulous likewise to have the largest beards: Eginard, secretary to Charlemain, speaking to the last kings of the first race, says, they came to the assemblies in the Field of Mars in a carriage drawn by oxen, and sat on the throne with their hair dishevelled, and a very long beard, *crine profuso, barba submissa, solio residerent, et speciem dominantis effingerent*.

Beard.

To touch any one's beard, or cut off a bit of it, was, among the first French, the most sacred pledge of protection and confidence. For a long time all letters that came from the sovereign had, for greater sanction, three hairs of his beard in the seal. There is still in being a charter of 1121, which concludes with the following words: *Quod ut ratum et stabile perseveret in posterum, presentis scripto sigilli mei robur apposui eum tribus pilis barba mea*.

Several great men have honoured themselves with the surname of *Bearded*. The Emperor Constantine is distinguished by the epithet of *Pogonate*, which signifies *the Bearded*. In the time of the Crusades, we find there was a *Geffery the Bearded*: Baldwin IV. earl of Flanders, was surname *Handsome-beard*; and, in the illustrious house of Montmorenci, there was a famous *Bouchard*, who took a pride in the surname of *Bearded*: he was always the declared enemy of the monks, without doubt because of their being shaved.

In the tenth century, we find, that King Robert (of France) the rival of Charles the Simple, was not more famous for his exploits than for his long white beard. In order that it might be more conspicuous to the soldiers when he was in the field, he used to let it hang down outside his cuirass: this venerable sight encouraged the troops in battle, and served to rally them when they were defeated.

A celebrated painter in Germany, called *John Mayo*, had such a large beard that he was nicknamed *John the Bearded*: it was so long that he wore it fastened to his girdle; and though he was a very tall man, it would hang upon the ground when he stood upright. He took the greatest care of this extraordinary beard; sometimes he would untie it before the Emperor Charles V. who took great pleasure to see the wind make it fly against the faces of the lords of his court.

In England, the famous chancellor Thomas More, one of the greatest men of his time, being on the point of falling a victim to court intrigues, was able, when on the fatal scaffold, to procure respect to his beard in presence of all the people, and saved it, as one may say, from the fatal stroke which he could not escape himself. When he had laid his head on the block, he perceived that his beard was likely to be hurt by the axe of the executioner; on which he took it away, saying, *My beard has not been guilty of treason; it would be an injustice to punish it*.

But let us turn our eyes to a more flattering object, and admire the beard of the best of kings, the ever precious beard of the great Henry IV. of France, which diffused over the countenance of that prince a majestic sweetness and amiable openness, a beard ever dear to posterity, and which should serve as a model for that of every great king; as the beard of his illustrious minister should for that of every minister. But what dependence is there to be put on the stability of the things of this world? By an event, as fatal as unforeseen, the beard, which was arrived at its highest degree of glory, all of a sudden lost its favour, and was at length entirely proscribed. The unexpected death of Henry the Great, and the youth of his successor, were the sole cause of it.

Louis XIII. mounted the throne of his glorious ancestors without a beard. Every one concluded immediately, that the courtiers, seeing their young king with

Beard.

with a smooth chin, would look upon their own as too rough. The conjecture proved right; for they presently reduced their beards to whiskers, and a small tuft of hair under the neither lip.

The people at first would not follow this dangerous example. The duke of Sully never would adopt this effeminate custom. This man, great both as a general and a minister, was likewise so in his retirement: he had the courage to keep his long beard, and to appear with it at the court of Louis XIII. where he was called to give his advice in an affair of importance. The young crop-bearded courtiers laughed at the sight of his grave look and old-fashioned phiz. The duke, nettled at the affront put on his fine beard, said to the king, "Sir, when your father, of glorious memory, did me the honour to consult me on his great and important affairs, the first thing he did was to send away all the buffoons and stage-dancers of his court."

The Czar Peter, who had so many claims to the surname of *Great*, seems to have been but little worthy of it on this occasion. He had the boldness to lay a tax on the beards of his subjects. He ordered that the noblemen and gentlemen, tradesmen and artificers (the priests and peasants excepted), should pay 100 rubles to be able to retain their beards; that the lower class of people should pay a copeck for the same liberty; and he established clerks at the gates of the different towns to collect these duties. Such a new and singular impost troubled the vast empire of Russia. Both religion and manners were thought in danger. Complaints were heard from all parts; they even went so far as to write libels against the sovereign; but he was inflexible, and at that time powerful. Even the fatal scenes of St Bartholomew were renewed against these unfortunate beards, and the most unlawful violences were publicly exercised. The razor and scissors were every where made use of. A great number, to avoid these cruel extremities, obeyed with reluctant sighs. Some of them carefully preserved the sad trimmings of their chins: and, in order to be never separated from these dear locks, ordered that they should be placed with them in their coffins.

Example, more powerful than authority, produced in Spain what it had not been able to bring about in Russia without great difficulty. Philip V. ascended the throne with a shaved chin. The courtiers imitated the prince, and the people, in turn, the courtiers. However, though this revolution was brought about without violence and by degrees, it caused much lamentation and murmuring; the gravity of the Spaniards lost by the change. The favourite custom of a nation can never be altered without incurring displeasure. They have this old saying in Spain; *Desde que no hay barba no hay mas alma*. "Since we have lost our beards, we have lost our souls."

Among the European nations that have been most curious in beards and whiskers, we must distinguish Spain. This grave romantic nation has always regarded the beard as the ornament which should be most prized; and the Spaniards have often made the loss of honour consist in that of their whiskers. The Portuguese, whose national character is much the same, are not the least behind them in that respect. In the reign of Catherine queen of Portugal, the brave John de

Castro had just taken in India the castle of Diu: victorious, but in want of every thing, he found himself obliged to ask the inhabitants of Goa to lend him a thousand pistoles for the maintenance of his fleet; and, as a security for that sum, he sent them one of his whiskers, telling them, "All the gold in the world cannot equal the value of this natural ornament of my valour; and I deposite it in your hands as a security for the money." The whole town was penetrated with this heroism, and every one interested himself about this invaluable whisker: even the women were desirous to give marks of their zeal for so brave a man: several sold their bracelets to increase the sum asked for; and the inhabitants of Goa sent him immediately both the money and his whisker. A number of other examples of this kind might be produced, which do as much honour to whiskers as to the good faith of those days.

In Louis XIII's reign, whiskers attained the highest degree of favour, at the expence of the expiring beards. In those days of gallantry, not yet empoisoned by wit, they became the favourite occupation of lovers. A fine black whisker, elegantly turned up, was a very powerful mark of dignity with the fair sex. Whiskers were still in fashion in the beginning of Louis XIV's reign. This king, and all the great men of his reign, took a pride in wearing them. They were the ornament of Turenne, Condé, Colbert, Corneille, Moliere, &c. It was then no uncommon thing for a favourite lover to have his whiskers turned up, combed, and pomatumed, by his mistress; and, for this purpose, a man of fashion took care to be always provided with every little necessary article, especially whisker-wax. It was highly flattering to a lady to have it in her power to praise the beauty of her lover's whiskers; which, far from being disgusting, gave his person an air of vivacity: several even thought them an incitement to love. It seems the levity of the French made them undergo several changes both in form and name: there were *Spanish*, *Turkish*, *guard dagger*, &c. whiskers; in short, *royal* ones, which were the last worn: their smallness proclaimed their approaching fall.

Consecration of the BEARD was a ceremony among the Roman youth, who, when they were shaved the first time, kept a day of rejoicing, and were particularly careful to put the hair of their beard into a silver or gold box, and make an offering of it to some god, particularly to Jupiter Capitolinus, as was done by Nero, according to Suetonius.

Kissing the BEARD. The Turkish wives kiss their husbands beards, and children their fathers, as often as they come to salute them. The men kiss one another's beards reciprocally on both sides, when they salute in the streets, or come off from any journey.

The Fashion of the BEARD has varied in different ages and countries; some cultivating and entertaining one part of it, some another. Thus the Hebrews wear a beard on their chin; but not on the upper-lip or cheeks. Moses forbids them to cut off entirely the angle or extremity of their beard; that is, to manage it after the Egyptian fashion, who left only a little tuft of beard at the extremity of their chin; whereas the Jews to this day suffer a little fillet of hair to grow from the lower end of their ears to their chins, where,

Beard.

Beard.

as well as on their lower-lips, their beards are in a pretty long bunch. The Jews, in time of mourning, neglected to trim their beards, that is, to cut off what grew superfluous on the upper-lips and cheeks. In time of grief and great affliction they also plucked off the hair of their beards.

Anointing the BEARD with unguents is an ancient practice both among the Jews and Romans, and still continues in use among the Turks; where one of the principal ceremonies observed in serious visits is to throw sweet-scented water on the beard of the visitant, and to perfume it afterwards with aloes-wood, which sticks to this moisture, and gives it an agreeable smell, &c. In middle-age writers we meet with *adlentare barbam*, used for stroking and combing it, to render it soft and flexible. The Turks, when they comb their beards, hold a handkerchief on their knees, and gather very carefully the hairs that fall; and when they have got together a certain quantity, they fold them up in paper, and carry them to the place where they bury the dead.

BEARD of a Comet, the rays which the comet emits towards that part of the heaven to which its proper motion seems to direct it; in which the beard of a comet is distinguished from the tail, which is understood of the rays emitted towards that part from whence its motion seems to carry it.

BEARD of a Horse, that part underneath the lower mandible on the outside and above the chin, which bears the curb. It is also called the *chuck*. It should have but little flesh upon it, without any chops, hardness, or swelling; and be neither too high raised nor too flat, but such as the curb may rest in its right place.

BEARD of a Muscle, oyster, or the like, denotes an assemblage of threads or hairs, by which those animals fasten themselves to stones. The hairs of this beard terminate in a flat spongy substance, which being applied to the surface of a stone, sticks thereto, like the wet leather used by boys.

BEARDS, in the history of insects, are two small, oblong, fleshy bodies, placed just above the trunk, as in the gnats, and in the moths and butterflies.

BEARDED, denotes a person or thing with a beard, or some resemblance thereof. The faces on ancient Greek and Roman medals are generally bearded. Some are denominated *pogonati*, as having long beards, *e. g.* the Parthian kings. Others have only a lanugo about the chin, as the Seleucid family. Adrian was the first of the Roman emperors who nourished his beard: hence all imperial medals before him are *beardless*; after him, *bearded*.

BEARDED Women have been all observed to want the menstrual discharge; and several instances are given by Hippocrates, and other physicians, or grown women, especially widows, in whom the menses coming to stop, beards appeared. Eusebius Nierembergius mentions a woman who had a beard reaching to her navel.

Of women remarkably bearded we have several instances. In the cabinet of curiosities of Stutgard in Germany, there is the portrait of a woman called *Bartel Graetje*, whose chin is covered with a very large beard. She was drawn in 1587, at which time she was but 25 years of age. There is likewise in the same cabinet another portrait of her when she was more advanced in life, but likewise with a beard.—It is said, that

the duke of Saxony had the portrait of a poor Swiss woman taken, remarkable for her long bushy beard; and those who were at the carnival at Venice in 1726, saw a female dancer astonish the spectators not more by her talents than by her chin covered with a black bushy beard.—Charles XII. had in his army a female grenadier: it was neither courage nor a beard that she wanted to be a man. She was taken at the battle of Pultowa, and carried to Petersburg, where she was presented to the Czar in 1724: her beard measured a yard and a half.—We read in the *Trévoux Dictionary*, that there was a woman seen at Paris, who had not only a bushy beard on her face, but her body likewise covered all over with hair. Among a number of other examples of this nature, that of Margaret, the governess of the Netherlands, is very remarkable. She had a very long stiff beard, which she prided herself on; and being persuaded that it contributed to give her an air of majesty, she took care not to lose a hair of it. This Margaret was a very great woman.—It is said, that the Lombard women, when they were at war, made themselves beards with the hair of their heads, which they ingeniously arranged on their cheeks, in order that the enemy, deceived by the likeness, might take them for men. It is asserted, after Suidas, that in a similar case the Athenian women did as much. These women were more men than our Jemmy-Jessamy countrymen.—About a century ago, the French ladies adopted the mode of dressing their hair in such a manner that curls hung down their cheeks as far as their bosom. These curls went by the name of *whiskers*. This custom undoubtedly was not invented, after the example of the Lombard women, to fright the men. Neither is it with intention to carry on a very bloody war, that in our time they have affected to bring forward the hair of the temple on the cheeks. The discovery seems to have been a fortunate one: it gives them a tempting, roguish look.

BEARERS, in heraldry. See *SUPPORTERS*.

BEARING, in navigation, an arch of the horizon intercepted between the nearest meridian and any distinct object, either discovered by the eye, or resulting from the sinical proportion; as in the first case, at 4 P. M. Cape Spado, in the isle of Candia, bore S. by W. by the compass. In the second, the longitudes and latitudes of any two places being given, and consequently the difference of latitude and longitude between them, the bearing from one to the other is discovered by the following analogy:

As the meridional difference of latitude

Is to the difference of longitude;

So is radius

To the tangent bearing.

BEARING is also the situation of any distant object, estimated from some part of the ship according to her position. In this sense, an object so discovered must be either ahead, astern, abreast, on the bow, or on the quarter. These bearings, therefore, which may be called *mechanical*, are on the beam, before the beam, abaft the beam, on the bow, on the quarter, ahead, or astern. If the ship sails with a side-wind, it alters the names of such bearings in some measure, since a distant object on the beam is then said to be to leeward or to windward; on the lee-quarter or bow, and on the weather-quarter or bow.

Bearers,
Bearing.

BEARING

Bearing
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Beast.

BEARING, in the sea-language. When a ship sails towards the shore, before the wind, she is said to *bear in* with the land or harbour. To let the ship sail more before the wind, is to *bear up*. To put her right before the wind, is to *bear round*. A ship that keeps off from the land, is said to *bear off*. When a ship that was to windward comes under a ship's stern, and so gives her the wind, she is said to *bear under her lee*, &c. There is another sense of this word, in reference to the burden of a ship; for they say a ship *bears*, when, having too slender or lean a quarter, she will sink too deep into the water with an overlight freight, and thereby can carry but a small quantity of goods.

BEARINGS, in heraldry, a term used to express a coat of arms, or the figures of armories by which the nobility and gentry are distinguished from the vulgar and from one another. See **HERALDRY**.

BEARING-Claws, among cock-fighters, denote the foremost toes, on which the bird goes; and if they be hurt or gravelled, he cannot fight.

BEARING of a Stag, is used in respect of the state of his head, or the croches which he bears on his horns. If you be asked what a stag bears, you are only to reckon the croches, and never to express an odd number: as, if he have four croches on his near horn and five on his far, you must say he bears ten; a false right on his near horn: if but four on the near horn and six on the far horn, you must say he bears twelve; a double false right on the near horn.

BEARN, a province of France, bounded on the east by Bigorre, on the south by the mountains of Aragon, on the west by Soule and part of Navarre, and on the north by Gascony and Armagnac. It lies at the foot of the Pyrenæan mountains, being about 16 leagues in length and 12 in breadth. In general it is but a barren country; yet the plains yield considerable quantities of flax, and a good quantity of Indian corn called *mailloc*. The mountains are rich in mines of iron, copper, and lead; some of them also are covered with vines, and others with pine trees; and they give rise to several mineral springs, and two considerable rivers, the one called the *Gave of Oleron*, and the other the *Gave of Bearn*. Some wine is exported from this country; and the Spaniards buy up great numbers of the horses and cattle, together with most of their linen, of which there is a considerable manufactory. The principal places are Pau, Lescar, Ortez, Navarreins, Salles, and Oleron.

BEAST, in a general sense, an appellation given to all four-footed animals, fit either for food, labour, or sport.

BEASTS of Burden, in a commercial sense, all four-footed animals which serve to carry merchandizes on their backs. The beasts generally used for this purpose are, elephants, dromedaries, camels, horses, mules, asses, and the sheep of Mexico and Peru.

BEASTS of the Chase are five, viz. the buck, the doe, the fox, the roe, and the martin.

BEASTS and Fowls of the Warren, are the hare, the coney, the pheasant and partridge.

BEASTS of the Forest, are the hart, hind, hare, boar, and wolf.

BEAST, among gamesters, a game at cards, played in this manner: The best cards are the king, queen, &c. whereof they make three heaps, the king, the play, and

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troilet. Three, four, or five, may play; and to every one is dealt five cards. However, before the play begins, every one stakes to the three heaps. He that wins most tricks, takes up the heap called the *play*; he that hath the king takes up the heap so called; and he that hath three of any sort, that is, three fours, three fives, three sixes, &c. takes up the troilet heap.

BEAT, in a general signification, signifies to chastise, strike, knock, or vanquish.

This word has several other significations in the manufactures, and in the arts and trades. Sometimes it signifies to forge and hammer; in which sense smiths and farriers say, to *beat iron*. Sometimes it means to pound, to reduce into powder: Thus we say, to *beat drugs*, to *beat pepper*, to *beat spices*; that is to say, to *pulverise them*.

BEAT, in fencing, denotes a blow or stroke given with the sword. There are two kinds of beats; the first performed with the foible of a man's sword on the foible of his adversary's, which in the schools is commonly called *baterie*, from the French *batre*, and is chiefly used in a pursuit, to make an open upon the adversary. The second and best kind of beat is performed with the fort of a man's sword upon the foible of his adversary's, not with a spring, as in binding, but with a jerk or dry beat; and is therefore most proper for the parades without or within the sword, because of the rebound a man's sword has thereby from his adversary's, whereby he procures to himself the better and surer opportunity of riposting.

BEAT, in the manege. A horse is said to *beat the dust*, when at each stroke or motion he does not take in ground or way enough with his fore-legs.—He is more particularly said to beat the dust at *terra à terra*, when he does not take in ground enough with his shoulders, making his strokes or motions too short, as if he made them all in one place. He *beats the dust at curvets*, when he does them too precipitately and too low. He *beats upon a walk*, when he walks too short, and thus rides but little ground, whether it be in straight lines, rounds, or passings.

BEAT of Drum, in the military art, is to give notice by beat of drum of a sudden danger; or, that scattered soldiers may repair to their arms and quarters, is to beat an alarm, or to arms. Also to signify, by different manners of sounding a drum, that the soldiers are to fall on the enemy; to retreat before, in, or after, an attack; to move or march from one place to another; to permit the soldiers to come out of their quarters at break of day; to order to repair to their colours, &c.; is to beat a charge, a retreat, a march, &c.

BEAT, in clock-making. See **BEATS**.

BEAT (St), a town of France, in the county of Comminges, at the confluence of the Garonne and the Pique. It is seated between two mountains which are close to the town on each side. All the houses are built with marble, because they have no other materials. W. Long. 1. 6. N. Lat. 42. 50.

BEATER is applied, in matters of commerce, to divers sorts of workmen, whose business is to hammer or flatten certain matters, particularly metals.

Gold-BEATERS, are artisans, who, by beating gold and silver with a hammer on a marble in moulds of vellum and bullocks guts, reduce them to thin leaves fit for gilding, or silvering of copper, iron, steel, wood,

N

&c.

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&c. Gold-beaters differ from flatters of gold or silver; as the former bring their metal into leaves by the hammer, whereas the latter only flatten it by pressing it through a mill preparatory to beating.

There are also *Tin-Beaters* employed in the looking-glass trade, whose business is to beat tin on large blocks of marble till it be reduced to thin leaves fit to be applied with quicksilver behind looking-glasses. See *FOLIATING, GOLD-Beating*.

BEATIFICATION, an act by which the pope declares a person beatified or blessed after his death. It is the first step towards canonization, or raising any one to the honour and dignity of a saint. No person can be beatified till 50 years after his or her death. All certificates or attestations of virtues and miracles, the necessary qualifications for sainthood, are examined by the congregation of rites. This examination often continues for several years; after which his holiness decrees the beatification. The corps and relics of the future saint are from thenceforth exposed to the veneration of all good Christians; his images are crowned with rays, and a particular office is set apart for him; but his body and relics are not carried in procession: indulgences likewise, and remission of sins, are granted on the day of his beatification; which though not so pompous as that of canonization, is however very splendid.

BEATING, or PULSATION, in medicine, the reciprocal agitation or palpitation of the heart or pulse.

BEATING Flax or Hemp, is an operation in the dressing of these matters, contrived to render them more soft and pliant.—When hemp has been swungled a second time, and the hurds laid by, they take the strikes, and dividing them into dozens and half dozens, make them up into large thick rolls, which being broached on long strikes, are set in the chimney corner to dry; after which they lay them in a round trough made for the purpose, and there with beetles beat them well till they handle both without and within as pliant as possible, without any hardness or roughness to be felt: that done, they take them from the trough, open and divide the strikes as before; and if any be found not sufficiently beaten, they roll them up and beat them over as before.

Beating hemp is a punishment inflicted on loose or disorderly persons.

BEATING, in book-binding, denotes the knocking a book in quires on a marble block, with a heavy broad-faced hammer, after folding, and before binding or stitching it. On the beating it properly, the elegance and excellence of the binding, and the easy opening of the book, principally depends.

BEATING, in the paper works, signifies the beating of paper on a stone with a heavy hammer, with a large smooth head and short handle, in order to render it more smooth and uniform, and fit for writing.

BEATING the Wind, was a practice in use in the ancient method of trial by combat. If either of the combatants did not appear in the field at the time appointed, the other was to beat the wind, or make so many flourishes with his weapon; by which he was intitled to all the advantages of a conqueror.

BEATING the Hands or Feet, by way of praise or approbation. See **APPLAUSE**.

BEATING Time, in music, a method of measuring

and marking the time for performers in concert, by a motion of the hand and foot up or down successively and in equal times. Knowing the true time of a crotchet, and supposing the measure actually subdivided into four crotchets, and the half measure into two, the hand or foot being up, if we put it down with the very beginning of the first note or crotchet, and then raise it with the third, and then down with the beginning of the next measure; this is called *beating the time*; and, by practice, a habit is acquired of making this motion very equal. Each down and up is sometimes called a *time* or *measure*. The general rule is, to contrive the division of the measure so, that every down and up of the beating shall end with a particular note, on which very much depends the distinctness, and, as it were, the sense of the melody. Hence the beginning of every time or beating in the measure is reckoned the accented part thereof.

Beating time is denoted, in the Italian music, by the term *à battuta*, which is usually put after what they call *recitativo*, where little or no time is observed, to denote, that here they are to begin again to mark or beat the time exactly.

The Romans aimed at somewhat of harmony in the strokes of their oars; and had an officer called *portifculus* in each galley, whose business was to beat time to the rowers, sometimes by a pole or mallet, and sometimes by his voice alone.

The ancients marked the rhyme in their musical compositions; but to make it more observable in the practice, they beat the measure or time, and this in different manners. The most usual consisted in a motion of the foot, which was raised from, and struck alternately against, the ground, according to the modern method. Doing this was commonly the province of the master of the music, who was thence called *μεισχορ* and *κορυφαίος*, because placed in the middle of the choir of musicians, and in an elevated situation, to be seen and heard more easily by the whole company. These beaters of measure were also called by the Greeks *ποδοκτύχοι* and *ποδοψίφοι*, because of the noise of their feet; and *συνίοναριοι*, because of the uniformity or monotony of the rhyme. The Latins denominated them *pedarii*, *podarii*, and *pedicularii*. To make the beats or strokes more audible, their feet were generally shod with a sort of sandals either of wood or iron, called by the Greeks *κρουπιζία*, *κρουπαλα*, *κρουπηλα*, and by the Latins *pedicula*, *scabella*, or *scabilla*, because like to little stools or foot-stools. Sometimes they beat upon sonorous foot-stools, with the foot shod with a wooden or iron sole. They beat the measure not only with the foot, but also with the right-hand, all the fingers whereof they joined together, to strike into the hollow of the left. He who thus marked the rhythm, was called *manuductor*. The ancients also beat time or measure with shells, as oyster-shells and bones of animals, which they struck against one another, much as the moderns now use castanets, and the like instruments. This the Greeks called *κρημναλίζειν*, as is noted by Hesychius. The scholiast on Aristophanes speaks much to the same purpose. Other noisy instruments, as drums, cymbals, citterns, &c. were also used on the same occasion. They beat the measure generally in two equal or unequal times; at least this holds of the usual rhythm of a piece of music, marked either by the noise of sandals, or the flapping

Beating.

of

Beating
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Beatorum.

of the hands, But the other rhythmic instruments last-mentioned, and which were used principally to excite and animate the dancers, marked the cadence after another manner; that is, the number of their percussions equalled, or even sometimes surpassed, that of the different sounds which composed the air or song played.

BEATING, with hunters, a term used of a stag, which runs first one way and then another. He is then said to *beat up and down*.—The noise made by conies in rutting time is also called *beating* or *tapping*.

BEATING, in navigation, the operation of making a progress at sea against the direction of the wind, in a zig-zag line, or traverse, like that in which we ascend a steep hill. See TACKING.

BEATITUDE, imports the supreme good, or the highest degree of happiness human nature is susceptible of; or the most perfect state of a rational being, wherein the soul has attained to the utmost excellency and dignity it is framed for. In which sense, it amounts to the same with what we otherwise call *blestness* and *sovereign felicity*; by the Greeks, *ευδαιμονια*; and by the Latins, *summum bonum*, *beatitudo*, and *beatitas*.

BEATITUDE, among divines, denotes the beatific vision, or the fruition of God in a future life to all eternity.

BEATITUDE is also used in speaking of the theses contained in Christ's sermon on the mount, whereby he pronounces blessed the poor in spirit, those that mourn, the meek, &c.

BEATON (David), archbishop of St Andrew's, and a cardinal of Rome, in the early part of the 16th century, was born in 1494. Pope Paul III. raised him to the degree of a cardinal in December 1538; and being employed by James V. in negotiating his marriages with the court of France, he was there consecrated bishop of Mirepoix. Soon after his instalment as archbishop of St Andrew's, he promoted a furious persecution of the reformers in Scotland; when the king's death put a stop, for a time, to his arbitrary proceedings, he being then excluded from affairs of government, and confined. He raised however so strong a party, that, upon the coronation of the young queen Mary, he was admitted of the council, made chancellor, and procured commission as legate *à latere* from the court of Rome. He now began to renew his persecution of heretics; and among the rest, of the famous Protestant preacher Mr George Wishart, whose sufferings at the stake the cardinal viewed from his window with apparent exultation. It is pretended, that Wishart at his death foretold the murder of Beaton; which indeed happened shortly after, he being assassinated in his chamber, May 29th, 1547. He was a haughty bigotted churchman, and thought severity the proper method of suppressing heresy; he had great talents, and vices that were no less conspicuous. See SCOTLAND.

BEATORUM INSULA (anc. geog.), seven days journey to the west of Thebæ, a district of the Nomos Oaïtes; called an *island*, because surrounded with sand, like an island in the sea, (Ulpian); yet abounding in all the necessities of life, though encompassed with vast sandy deserts, (Strabo); which some suppose to be a third Oasis, in the Regio Ammoniaca; and the site of the temple of Ammon answers to the above

description, as appears from the writers on Alexander's expedition thither. It was a place of relegation or banishment for real or pretended criminals from which there was no escape. (Ulpian).

BEATS, in a watch or clock, are the strokes made by the fangs or pallets of the spindle of the balance, or of the pads in a royal pendulum. See CLOCK and WATCH.

BEUCAIRE, a town of Languedoc in France, situated on the banks of the river Rhone, in E. Long. 5. 49. N. Lat. 43. 39.

BEAUCE, a province of France, lying between the isle of France, Blafois, and Orleanois. It is so very fertile in wheat, that it is called the *Granary* of Paris. Chartres is the principal town.

BEAVER, in zoology. See CASTOR.

BEAVER-SKINS, in commerce. Of these, merchants distinguish three sorts; the new, the dry, and the fat.

The new beaver, which is also called the *white beaver*, or *Muscovy beaver*, because it is commonly kept to be sent into Muscovy, is that which the savages catch in their winter hunting. It is the best, and the most proper for making fine furs, because it has lost none of its hair by shedding.

The dry beaver, which is sometimes called *lean beaver*, comes from the summer hunting, which is the time when these animals lose part of their hair. Tho' this sort of beaver be much inferior to the former, yet it may also be employed in furs; but it is chiefly used in the manufacture of hats. The French call it *summer castor*, or *beaver*.

The fat beaver is that which has contracted a certain gross and oily humour, from the sweat which exhales from the bodies of the savages, who wear it for some time. Though this sort be better than the dry beaver, yet it is used only in the making of hats.

Besides hats and furs, in which the beaver's hair is commonly used, they attempted in France, in the year 1699, to make other manufactures of it: and accordingly they made cloths, flannels, stockings, &c. partly of beaver's hair, and partly of Segovia wool. This manufactory, which was set up at Paris, in St Anthony's suburbs, succeeded at first pretty well; and according to the genius of the French, the novelty of the thing brought into some repute the stuffs, stockings, gloves, and cloth, made of beaver's hair. But they went out of fashion on a sudden, because it was found, by experience, that they were of a very bad wear, and besides that the colours faded very much; when they had been wet, they became dry and hard, like felt, which occasioned the miscarriage of the manufactory for that time.

When the hair has been cut off from the beavers skins, to be used in the manufacturing of hats, those skins are still employed by several workmen; namely, by the trunk-makers, to cover trunks and boxes; by the shoemakers, to put into slippers; and by turners, to make sieves for sifting grain and seeds.

BEAUFORT, a town of Anjou in France, with a castle, near the river Authion. It contains two parishes and a convent of Recolets, and yet has not 100 houses. W. Long. 0. 3. N. Lat. 47. 26.

BEAUFORT gives title of Duke in England to the noble family of Somerset, who are lineally descended from John of Gaunt duke of Lancaster, whose duchess resided in this town.

Beats
||
Beaufort.

Beaufort
||
Beaumaris.

BEAUFORT, a strong town of Savoy in Italy, on the river Oron. E. Long. 6. 48. N. Lat. 45. 40.

BEAUGENCY, a town of the Orleanois in France, seated on the river Loire, in E. Long. 1. 46. N. Lat. 47. 48.

BEAUJEU, a town of France in Beaujolois, with an old castle. It is seated on the river Ardieres, at the foot of a mountain, in E. Long. 4. 40. N. Lat. 46. 9.

BEAUJOLOIS, a district of France, bounded on the south by Lionnois proper, on the west by Forez, on the north by Burgundy, and on the east by the principality of Dombes. It is 25 miles in length, and 20 in breadth: Ville Franche is the capital town.

BEAULIEU (Sebastian de Pontault de), a celebrated French engineer, and field marshal under Louis XIV. He published plans of all the military expeditions of his master, with military lectures annexed. He died in 1674.

BEAUMARIS, a market-town of Anglesey in North Wales, which sends one member to parliament. W. Long. 4. 15. N. Lat. 53. 25.

It is, as the name implies, pleasantly seated on a low land at the water's edge; is neat and well built, and one street is very handsome. Edward I. created the place; for after founding the castles of Caernarvon and Conway, he discovered that it was necessary to put another curb on the Welch. He therefore built a fortress here in 1295; and fixed on a marshy spot, near the chapel of St Meugan, such as gave him opportunity of forming a great foss round the castle, and of filling it with water from the sea. He also cut a canal, in order to permit vessels to discharge their lading beneath the walls: and as a proof of the existence of such a conveniency, there were within this century iron rings affixed to them, for the purpose of mooring the ships or boats. The marsh was in early times of far greater extent than at present, and covered with fine bulrushes. The first governor was Sir William Pickmore, a Gascon knight appointed by Edward I. There was a constable of the castle, and a captain of the town. The first had an annual fee of forty pounds, the last of twelve pounds three shillings and four pence; and the porter of the gate of Beaumaris had nine pounds two shillings and sixpence. Twenty-four soldiers were allowed for the guard of the castle and town, at fourpence a day to each. The constable of the castle was always captain of the town, except in one instance: in the 36th of Henry VI. Sir John Boteler held the first office, and Thomas Norreys the other. The castle was extremely burthensome to the country: quarrels were frequent between the garrison and the country people. In the time of Henry VI. a bloody fray happened, in which David ap Evan ap Howel of Llwydiarth, and many others, were slain. From the time of Sir Rowland Villeville, *alias* Britayne, reputed base son of Henry VII. and constable of the castle, the garrison was withdrawn till the year 1642, when Thomas Cheadle, deputy to the earl of Dorset, then constable, put into it men and ammunition. In 1643, Thomas Bulkeley, Esq; soon after created Lord Bulkeley, succeeded: his son Colonel Richard Bulkeley, and several gentlemen of the country, held it for the king till June 1646, when it surrendered on honourable terms to general Mytton, who made captain Evans his deputy governor. In 1653,

the annual expence of the garrison was seventeen hundred and three pounds. Edward I. when he built the town, surrounded it with walls, made it a corporation, and endowed it with great privileges, and lands to a considerable value. He removed the ancient freeholders by exchange of property into other countries. Henllys, near the town, was the seat of Gwerydd ap Rhys Goch, one of fifteen tribes, and of his posterity till this period, when Edward removed them to Boddle Wyddan in Flintshire, and bestowed their ancient patrimony on the corporation. It sends one member to parliament. Its first representative was Maurice Griffydd, who sat in the seventh year of Edward VI. There is very good anchorage for ships in the bay which lies before the town; and has seven fathom water even at the lowest ebb. Vessels often find security here in hard gales. The town has no trade of any kind, yet has its customhouse for the casual reception of goods. The ferry lies near the town, and is passable at low water. It was granted by charter to the corporation in the 4th of Queen Elizabeth. There is an order from Edward II. to Robert Power, chamberlain of North Wales, to inspect into the state of the boat, which was then out of repair; and in case it was feasible, to cause it to be made fit for use, at the expence of the baileywick: but if the boat proved past repair, a new one was to be built, and the expence allowed by the king. It appears, that the people of Beaumaris paid annually for the privilege of a ferry thirty shillings into the exchequer; but by this order it seems that the king was to find the boat. After passing the channel, the distance over the sands to Aber in Caernarvonshire, the point the passenger generally makes for, is four miles. The sands are called *Traeth Telavan*, and *Wylofaen*, or the *place of weeping*, from the shrieks and lamentations of the inhabitants when it was overwhelmed by the sea, in the days of Helig ap Clunog. The church is dependant on Llandegvan, which is in the gift of lord Bulkeley. The former is called the *chapel of the blessed virgin*; yet in ancient writings one aisle is called *St Mary's chapel*, and another that of *St Nicholas*.

BEAUMONT (Sir John), the elder brother of Mr Francis Beaumont the famous dramatic poet, was born in the year 1582, and in 1626 had the dignity of a baronet conferred upon him by king Charles I. In his youth he applied himself to the Muses with good success; and wrote, *The Crown of Thorns*, a poem, in eight books: a miscellany, intitled, *Bosworth Field*: Translations from the Latin Poets: and several poems on religious and political subjects; as, *On the Festivals*; *On the Blessed Trinity*; *A Dialogue between the World, a Pilgrim, and Virtue*; *Of the miserable State of Man*; *Of Sickness*, &c. He died in 1628. His poetic genius was celebrated by Ben Johnson, Michael Drayton, and others.

BEAUMONT and FLETCHER, two celebrated English dramatic writers, who flourished in the reign of James I. and so closely connected both as authors and as friends, that it has been judged not improper to give them under one article.

Mr Francis Beaumont was descended from an ancient family of his name at Grace-dieu in Leicestershire, where he was born about the year 1585 or 1586, in the reign of Queen Elizabeth. His grandfather, John

Beaumaris,
Beaumont.

Beaumont. John Beaumont, was master of the rolls, and his father Francis Beaumont one of the judges of the common-pleas. He was educated at Cambridge, and afterwards admitted of the Inner Temple. It is not, however, apparent that he made any great proficiency in the law, that being a study probably too dry and unentertaining to be attended to by a man of his fertile and sprightly genius. And indeed we should scarcely be surprised to find that he had given no application to any study but poetry, nor attended on any court but that of the Muses: but on the contrary, our admiration might fix itself in the opposite extreme, and fill us with astonishment at the extreme assiduity of his genius and rapidity of his pen, when we look back on the voluminousness of his works, and then inquire into the time allowed him for them; works that might well have taken up a long life to have executed. For although, out of 53 plays which are collected together as the labours of these united authors, Mr Beaumont was concerned in much the greatest part of them, yet he did not live to complete his 30th year, the king of terrors summoning him away in the beginning of March 1615, on the 9th day of which he was interred in the entrance of St Benedict's chapel in Westminster-Abbey. There is no inscription on his tomb: But there are two epitaphs to his memory; one by his elder brother Sir John Beaumont:

On death, thy murderer, this revenge I take;
I slight his terrors, and just question make,
Which of us two the best precedence have,
Mine to this wretched world, thine to the grave?
'Thou should'st have followed me; but death, to blame,
Miscounted years, and measur'd age by fame.
So dearly hast thou bought thy precious lines;
Their praise grew swiftly, so thy life declines.
Thy muse, the hearer's queen, the reader's love,
All ears, all hearts (but death's), could please and move.
Bosworth Field, p. 164.

The other is by Bishop Corbet. (*Poems, p. 68.*)

He that hath such acuteness and such wit,
As would ask ten good heads to husband it:
He that can write so well, that no man dare
Resume it for the best; let him beware:
Beaumont is dead; by whose sole death appears,
Wit's a disease consumes men in few years.

He left a daughter, Francis Beaumont, who died in Leicestershire since the year 1700. She had in her possession several poems of her father's writing; but they were lost at sea in her voyage from Ireland, where she had lived for some time in the duke of Ormond's family.

Mr John Fletcher was not more meanly descended than his poetical colleague; his father, the reverend Dr Fletcher, having been first made bishop of Bristol by queen Elizabeth, and afterwards by the same monarch, in the year 1593, translated to the rich and honourable see of London. Our poet was born in 1576; and was, as well as his friend, educated at Cambridge, where he made a great proficiency in his studies, and was accounted a very good scholar. His natural vivacity of wit, for which he was remarkable, soon rendered him a devotee to the muses; and his close attention to their service, and fortunate connection with a genius

equal to his own, soon raised him to one of the highest places in the temple of poetical fame. As he was born near ten years before Mr Beaumont, so did he also survive him by an equal number of years; the general calamity of a plague, which happened in the year 1625, involving him in its great destruction, he being at that time 49 years of age.

During the joint lives of these two great poets, it appears that they wrote nothing separately, excepting one little piece by each, which seemed of two trivial a nature for either to require assistance in, viz. *The Faithful Shepherd*, a pastoral, by Fletcher; and *The Masque of Gray's-Inn Gentlemen*, by Beaumont. Yet what share each had in the writing or designing of the pieces thus composed by them jointly, there is no possibility of determining. It is however generally allowed, that Fletcher's peculiar talent was *wit*, and Beaumont's, though much the younger man, *judgment*. Nay, so extraordinary was the latter property in Mr Beaumont, that it is recorded of the great Ben Johnson, who seems moreover to have had a sufficient degree of self-opinion of his own abilities, that he constantly, so long as this gentleman lived, submitted his own writings to his censure, and, as it is thought, availed himself of his judgment at least in the correcting, if not even in the contriving all his plots. It is probable, therefore, that the forming the plots and contriving the conduct of the fable, the writing of the more serious and pathetic parts, and lopping the redundant branches of Fletcher's wit, whose luxuriance, we are told, frequently stood in need of castigation, might be in general Beaumont's portion in the work; while Fletcher, whose conversation with the *beau monde* (which indeed both of them from their births and stations in life had been ever accustomed to), added to the volatile and lively turn he possessed, rendered him perfectly master of dialogue and polite language, might execute the designs formed by the other, and raise the superstructure of those lively and spirited scenes which Beaumont had only laid the foundation of; and in this he was so successful, that though his wit and raillery were extremely keen and poignant, yet they were at the same time so perfectly genteel, that they used rather to please than disgust the very persons on whom they seemed to reflect. Yet that Fletcher was not entirely excluded from a share in the conduct of the drama, may be gathered from a story related by Winstanley, viz. that our two bards having concerted the rough draught of a tragedy over a bottle of wine at a tavern, Fletcher said, he would undertake to *kill the king*; which words being overheard by the waiter, who had not happened to have been witness to the context of their conversation, he lodged an information of treason against them. But on their explanation of it only to mean the destruction of a theatrical monarch, their loyalty moreover being unquestioned, the affair ended in a jest.

On the whole, the works of these authors have undoubtedly very great merit, and some of their pieces deservedly stand on the list of the present ornaments of the theatre. The plots are ingenious, interesting, and well managed; the characters strongly marked; and the dialogue sprightly and natural: yet there is in the latter a coarseness which is not suitable to the politeness of the present age; and a fondness of repartee, which frequently runs into obscenity; and which we may suppose

Beaumont pose was the vice of that time, since even the delicate Shakespeare himself is not entirely free from it. But as these authors have more of that kind of wit than the last-mentioned writer, it is not to be wondered if their works were, in the licentious reign of Charles II. preferred to his. Now, however, to the honour of the present taste be it spoken, the tables are entirely turned; and while Shakespeare's immortal works are our constant and daily fare, those of Beaumont and Fletcher, though delicate in their kind, are only occasionally served up: and even then great pains are taken to clear them of that *fumet*, which the *haut gout* of their contemporaries considered as their supremest relish, but which the more undepraved taste of ours has been justly taught to look on as what it really is, no more than a corrupt and unwholesome taint.

Some of their plays were printed in quarto during the lives of the authors; and in the year 1645 there was published in folio a collection of such plays as had not been printed before, amounting to between 30 and 40. This collection was published by Mr Shirley, after the shutting up of the theatres; and dedicated to the Earl of Pembroke by ten of the most famous actors. In 1679 there was an edition of all their plays published in folio; another edition in 1711 by Mr Tonson in seven volumes 8vo, and the last in 1751.

BEAUMONT, a town of the Netherlands, in Hainault, on the confines of the territory of Liege. It was ceded to the French in 1684; and taken in 1691 by the English, who blew up the castle. It is situated between the rivers Maese and Sambre, in E. Long. 4. 1. N. Lat. 50. 12.

BEAUMONT le Roger, a town of Upper Normandy in France. E. Long. 0. 56. N. Lat. 49. 2.

BEAUMONT le Vicompte, a town of Maine in France. E. Long. 0. 10. N. Lat. 48. 12.

BEAUMONT sur Oise, a town in the Isle of France, seated on the declivity of a hill, with a bridge over the river Oise. E. Long. 2. 29. N. Lat. 49. 9.

BEAUNE, a handsome town of France, in Burgundy, remarkable for its excellent wine, and for an hospital founded here in 1443. Its collegiate church is also one of the finest in France; the great altar is adorned with a table enriched with jewels; and its organs are placed on a piece of architecture which is the admiration of the curious. E. Long. 4. 50. N. Lat. 47. 2.

BEAUSOBRE (Isaac de), a very learned Protestant writer of French original, was born at Niort in 1659. He was forced into Holland to avoid the execution of a sentence upon him, which condemned him to make the *amende honorable*; and this for having broken the royal signet, which was put upon the door of a church of the Reformed, to prevent the public profession of their religion. He went to Berlin in 1694; was made chaplain to the king of Prussia, and counsellor of the royal consistory. He died in 1738, aged 79, after having published several works: as, 1. *Défense de la Doctrine des Reformes*. 2. A Translation of the New Testament and Notes, jointly with M. Lefant; much esteemed by the Reformed. 3. *Dissertation sur les Adamites de Boheme*; a curious work. 4. *Histoire Critique de Manichee et du Manichéisme*, 2 tom. in 4to. This has been deemed by philosophers an interesting question, and nobody has developed it better than this

author. 5. Several dissertations in the *Bibliothèque Britannique*.—Mr Beaufobre had strong sense with profound erudition, and was one of the best writers among the Reformed; he preached as he wrote, and he did both with warmth and spirit.

BEAUTY, in its native signification, is appropriated to objects of sight. Objects of the other senses may be agreeable, such as the sounds of musical instruments, the smoothness and softness of some surfaces; but the agreeableness called *beauty* belongs to objects of sight.

Objects of sight are more complex than those of any other sense: in the simplest, we perceive colour, figure, length, breadth, thickness. A tree is composed of a trunk, branches, and leaves; it has colour, figure, size, and sometimes motion: by means of each of these particulars, separately considered, it appears beautiful; but a complex perception of the whole greatly augments the beauty of the object. The human body is a composition of numberless beauties arising from the parts and qualities of the object, various colours, various motions, figures, size, &c. all united in one complex object, and striking the eye with combined force. Hence it is, that beauty, a quality so remarkable in visible objects, lends its name to every thing that is eminently agreeable. Thus, by a figure of speech, we say, a *beautiful sound*, a *beautiful thought*, a *beautiful discovery*, &c.

Considering attentively the beauty of visible objects, *Elements of Criticism*. two kinds are discovered. The first may be termed *intrinsic* beauty, because it is discovered in a single object, without relation to any other: the other may be termed *relative*, being founded on the relation of objects. Intrinsic beauty is a perception of sense merely; for to perceive the beauty of a spreading oak, or of a flowing river, no more is required but singly an act of vision. Relative beauty is accompanied with an act of understanding and reflection: for we perceive not the relative beauty of a fine instrument or engine until we learn its use and destination. In a word, intrinsic beauty is ultimate; and relative beauty is that of means relating to some good end or purpose. These different beauties agree in one capital circumstance, that both are equally perceived as belonging to the object; which will be readily admitted with respect to intrinsic beauty, but is not so obvious with respect to the other. The utility of the plough, for example, may make it an object of admiration or of desire; but why should utility make it beautiful? A natural propensity of the human mind will explain this difficulty: By an easy transition of ideas, the beauty of the effect is transferred to the cause, and is perceived as one of the qualities of the cause. Thus a subject void of intrinsic beauty appears beautiful by its utility; a dwelling-house void of all regularity is however beautiful in the view of convenience; and the want of symmetry in a tree will not prevent its appearing beautiful, if it be known to produce good fruit.

When these two beauties concur in any object, it appears delightful. Every member of the human body possesses both in a high degree.

The beauty of utility, being accurately proportioned to the degree of utility, requires no illustration: But intrinsic beauty, being more complex, cannot be handled distinctly without being analysed. If a tree be beautiful

Beauty. tiful by means of its colour, figure, motion, size, &c. it is in reality possessed of so many different beauties. The beauty of colour is too familiar to need explanation. The beauty of figure is more: for example, viewing any body as a whole, the beauty of its figure arises from regularity and simplicity; viewing the parts with relation to each other, uniformity, proportion, and order, contribute to its beauty. The beauties of grandeur and motion are considered separately. See **GRANDEUR** and **MOTION**.

We shall here make a few observations on simplicity, which may be of use in examining the beauty of single objects. A multitude of objects crowding into the mind at once, disturb the attention, and pass without making any lasting impression: In the same manner, even a single object, consisting of a multiplicity of parts, equals not, in strength of impression, a more simple object comprehended in one view. This justifies simplicity in works of art, as opposed to complicated circumstances and crowded ornaments.

It would be endless to enumerate the effects that are produced by the various combinations of the principles of beauty. A few examples will be sufficient to give the reader some idea of this subject. A circle and a square are each perfectly regular: a square, however, is less beautiful than a circle; and the reason is, that the attention is divided among the sides and angles of a square; whereas the circumference of a circle, being a single object, makes one entire impression: And thus simplicity contributes to beauty. For the same reason a square is more beautiful than a hexagon or octagon. A square is likewise more beautiful than a parallelogram, because it is more regular and uniform. But this holds with respect to intrinsic beauty only: for in many instances, as in the doors and windows of a dwelling-house, utility turns the scales on the side of the parallelogram.

Again, a parallelogram depends, for its beauty, on the proportion of its sides: A great inequality of its sides annihilates its beauty: Approximation toward equality hath the same effect; for proportion there degenerates into imperfect uniformity, and the figure appears an unsuccessful attempt toward a square. And hence proportion contributes to beauty.

An equilateral triangle yields not to a square in regularity nor in uniformity of parts, and it is more simple. But an equilateral triangle is less beautiful than a square; which must be owing to inferiority of order in the position of its parts; the order arising from the equal inclination of the sides of such an angle is more obscure than the parallelism of the sides of a square. And hence order contributes to beauty not less than simplicity, regularity, or proportion.

Uniformity is singular in one circumstance, that it is apt to disgust by excess. A number of things destined for the same use, as windows, chairs, &c. cannot be too uniform. But a scrupulous uniformity of parts in a large garden or field is far from being agreeable.

In all the works of nature simplicity makes a capital figure. In also makes a figure in works of art: Profuse ornament in painting, gardening, or architecture, as well as in dress or in language, shows a mean or corrupted taste. Simplicity in behaviour and manners has an enchanting effect, and never fails to gain our affec-

Beauty. tion. Very different are the artificial manners of modern times. A gradual progress from simplicity to complex forms and profuse ornament, seems to be the fate of all the fine arts; resembling behaviour, which from original candour and simplicity has degenerated into duplicity of heart and artificial refinements. At present, literary productions are crowded with words, epithets, figures: In music, sentiment is neglected for the luxury of harmony, and for difficult movement.

With regard to the final cause of beauty, one thing is evident, that our relish of regularity, uniformity, proportion, order, and simplicity, contributes greatly to enhance the beauty of the objects that surround us, and of course tends to our happiness. We may be confirmed in this thought, upon reflecting, that our taste for these particulars is not accidental, but uniform and universal, making a branch of our nature. At the same time, regularity, uniformity, order, and simplicity, contribute each of them to readiness of apprehension, and enable us to form more distinct ideas of objects than can be done where these particulars are wanting. In some instances, as in animals, proportion is evidently connected with utility, and is the more agreeable on that account.

Beauty, in many instances, promotes industry; and as it is frequently connected with utility, it proves an additional incitement to enrich our fields and improve our manufactures. These, however, are but slight effects, compared with the connections that are formed among individuals in society by means of beauty. The qualifications of the head and heart are undoubtedly the most solid and most permanent foundations of such connections: But as external beauty lies more in view, and is more obvious to the bulk of mankind, than the qualities now mentioned, the sense of beauty has a more extensive influence in forming these connections. At any rate, it concurs in an eminent degree with mental qualifications, in producing social intercourse, mutual good will, and consequently mutual aid and support, which are the life of society: it must not however be overlooked, that the sense of beauty does not tend to advance the interests of society, but when in a due mean with respect to strength. Love, in particular, arising from a sense of beauty, loses, when excessive, its social character: the appetite for gratification, prevailing over affection for the beloved object, is ungovernable, and tends violently to its end, regardless of the misery that must follow. Love, in this state, is no longer a sweet agreeable passion: it becomes painful, like hunger or thirst; and produceth no happiness but in the instant of fruition. This suggests an important lesson, that moderation in our desires and appetites, which fits us for doing our duty, contributes at the same time the most to happiness; even social passions, when moderate, are more pleasant than when they swell beyond proper bounds.

Human or Personal BEAUTY, only slightly touched upon in the preceding article, merits more particular discussion; and may be considered under these four heads: Colour, Form, Expression, and Grace; the two former being, as it were, the Body, the two latter the Soul, of beauty.

1. *Colour.* Although this be the lowest of all the constituent parts of beauty, yet it is vulgarly the most striking, and the most observed. For which there is

Beauty. a very obvious reason to be given; that "every body can see, and very few can judge; the beauties of colour requiring much less of judgment than either of the other three.

As to the colour of the body in general, the most beautiful perhaps that ever was imagined, was that which Apelles expressed in his famous Venus; and which, though the picture itself be lost, Cicero has in some degree preserved to us, in his excellent description of it. It was (as we learn from him) a fine red, beautifully intermixed and incorporated with white; and diffused, in its due proportions, through each part of the body. Such are the descriptions of a most beautiful skin, in several of the Roman poets; and such often is the colouring of Titian, and particularly in his sleeping Venus, or whatever other beauty that charming piece was meant to represent.

The reason why these colours please so much, is not only their natural liveliness, nor the much greater charms they obtain from their being properly blended together, but is also owing in some degree to the idea they carry with them of good health; without which all beauty grows languid and less engaging; and with which it always recovers an additional life and lustre.

As to the colour of the face in particular, a great deal of beauty is owing (beside the causes already mentioned) to variety; that being designed by nature for the greatest concurrence of different colours, of any part in the human body. Colours please by opposition; and it is in the face that they are the most diversified, and the most opposed.

It is an observation apparently whimsical, but perhaps not unjust, that the same thing which makes a fine evening, makes a fine face; that is, as to the particular part of beauty now under consideration.

The beauty of an evening sky, about the setting of the sun, is owing to the variety of colours that are scattered along the face of the heavens. It is the fine red clouds, intermixed with white, and sometimes darker ones, with the azure bottom appearing here and there between them, which makes all that beautiful composition that delights the eye so much, and gives such a serene pleasure to the heart. In the same manner, if you consider some beautiful faces, you may observe, that it is much the same variety of colours which gives them that pleasing look; which is so apt to attract the eye, and but too often to engage the heart. For all this sort of beauty is resolvable into a proper variation of flesh colour and red, with the clear blueness of the veins pleasingly intermixed about the temples and the going off of the cheeks, and set off by the shades of full eye-brows; and of the hair, when it falls in a proper manner round the face.

It is for much the same reason that the best landscape-painters have been generally observed to choose the autumnal part of the year for their pieces, rather

Beauty. than the spring. They prefer the variety of shades and colours, though in their decline, to all their freshness and verdure in their infancy; and think all the charms and liveliness even of the spring, more than compensated by the choice, opposition, and richness of colours, that appear almost on every tree in the autumn.

Though one's judgment is apt to be guided by particular attachments (and that more perhaps in this part of beauty than any other), yet the general persuasion seems well founded, that a complete brown beauty is really preferable to a perfect fair one; the bright brown giving a lustre to all the other colours, a vivacity to the eyes, and a richness to the whole look, which one seeks in vain in the whitest and most transparent skins. Raphael's most charming Madonna is a brunette beauty; and his earlier Madonnas (or those of his middle style) are generally of a lighter and less pleasing complexion. All the best artists in the noblest age of painting, about Leo the tenth's time, used this deeper and richer kind of colouring; and perhaps one might add, that the glaring lights introduced by Guido, went a great way towards the declension of that art; as the enfeebling of the colours by Carlo Marat (or his followers) hath since almost completed the fall of it in Italy.

Under this article colour, it seems doubtful whether some things ought not to be comprehended which are not perhaps commonly meant by that name: As that appearing softness or silkiness of some skins; that (A) Magdalen-look in some fine faces, after weeping; that brightness, as well as tint, of the hair; that lustre of health that shines forth upon the features; that luminousness that appears in some eyes, and that fluid fire, or glistening, in others: Some of which are of a nature so much superior to the common beauties of colour, that they make it doubtful whether they should not have been ranked under a higher class, and reserved for the expression of the passions. They are, however, mentioned here; because even the most doubtful of them appear to belong partly to this head, as well as partly to the other.

2. *Form.* This takes in the turn of each part, as well as the symmetry, of the whole body, even to the turn of an eye-brow, or the falling of the hair. Perhaps, too, the attitude, while fixed, ought to be reckoned under this article: By which is not only meant the posture of the person, but the position of each part; as the turning of the neck, the extending of the hand, the placing of a foot; and so on to the most minute particulars.

The general cause of beauty in the form or shape in both sexes is a proportion, or an union and harmony, in all parts of the body.

The distinguishing character of beauty in the female form, is delicacy and softness; and in the male, either

apparent

(A) The look here meant is most frequently expressed by the best painters in their Magdalens; in which, if there were no tears on the face, you would see, by the humid redness of the skin, that she had been weeping extremely. There is a very strong instance of this in a Magdalen by Le Brun, in one of the churches at Paris; and several by Titian, in Italy; the very best of which is at the Barberino palace at Venice. In speaking of which, Rosalba hardly went too far, when she said, "It wept all over;" or (in the very words she used) "Elle pleure jusqu' aux bouts de doigts."

Beauty. apparent strength or agility. The finest exemplars that can be seen for the former, is the Venus of Medici; and for the two latter, the Hercules Farnese and the Apollo Belvedere.

There is one thing indeed in the last of these figures which exceeds the bounds of our present inquiry; what an Italian artist called *Il sovra umano*; and what we may call the transcendent, or celestial. It is something distinct from all human beauty, and of a nature greatly superior to it; something that seems like an air of divinity: Which is expressed, or at least is to be traced out, in but very few works of the artists; and of which scarce any of the poets have caught any ray in their descriptions (or perhaps even in their imagination), except Homer and Virgil, among the ancients; and our Shakespeare and Milton among the moderns.

The beauty of the mere human form is much superior to that of colour; and it may be partly for this reason, that when one is observing the finest works of the artists at Rome (where there is still the noblest collection of any in the world), one feels the mind more struck and more charmed with the capital statues, than with the pictures of the greatest masters.

One of the old Roman poets, in speaking of a very handsome man, who was candidate for the prize in some of the public games, says, that he was much expected and much admired by all the spectators at his first appearance; but that, when he flung off his robes, and discovered the whole beauty of his shape altogether, it was so superior, that it quite extinguished the

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beauties they had before so much admired in his face. Much the same effect may be felt in viewing the Venus of Medici. If you observe the face only, it appears extremely beautiful; but if you consider all the other elegancies of her make, the beauty of her face becomes less striking, and is almost lost in such a multiplicity of charms.

Whoever would learn what makes the beauty of each part of the human body, may find it laid down pretty much at large, by (c) *Felibien*; or may study it with more pleasure to himself, in the finest pictures and statues; for in life we commonly see but a small part of the human body, most of it being either disguised or altered by what we call dress.

In fact we do not only thus, in a great measure, hide beauty; but even injure, and kill it, by some parts of dress. A child is no sooner born into the world, than it is bound up, almost as firmly as an old Egyptian mummy, in several folds of linen. It is in vain for him to give all the signs of distress that nature has put in his power, to show how much he suffers whilst they are thus imprisoning his limbs; or all the signs of joy, every time they are set at liberty. In a few minutes, the old witch who presides over his infirmest days, falls to tormenting him afresh, and winds him up again in his destined confinement. When he comes to be dressed like a man, he has ligatures applied to his arms, legs, and middle; in short, all over him; to prevent the natural circulation of his blood, and make him less active and healthy: and if it be a child of the tenderer sex, she must be bound yet more straitly about

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(c) In his *Entretiens*, vol. ii. p. 14—45. The chief of what he says there, on the beauty of the different parts of the female form, is as follows: That the head should be well rounded; and look rather inclining to small than large. The forehead, white, smooth, and open (not with the hair growing down too deep upon it); neither flat nor prominent, but like the head, well rounded; and rather small in proportion than large. The hair, either bright black or brown; not thin, but full and waving; and if it falls in moderate curls the better. The black is particularly useful for setting off the whiteness of the neck and skin. The eyes black, chestnut, or blue; clear, bright, and lively; and rather large in proportion than small. The eye brows, well divided, rather full than thin; semicircular, and broader in the middle than at the ends; of a neat turn, but not formal. The cheeks should not be wide; should have a degree of plumpness, with the red and white finely blended together; and should look firm and soft. The ear should be rather small than large; well folded, and with an agreeable tinge of red. The nose should be placed so as to divide the face into two equal parts; should be of a moderate size, straight, and well-squared; though sometimes a little rising in the nose, which is but just perceivable, may give a very graceful look to it. The mouth should be small; and the lips not of equal thickness: They should be well turned, small rather than gross; soft, even to the eye; and with a living red in them. A truly pretty mouth is like a rose-bud that is beginning to blow. The teeth should be middle sized, white, well-ranged, and even. The chin of a moderate size; white, soft, and agreeably rounded. The neck should be white, straight, and of a soft, easy, and flexible make, rather long than short; less above, and increasing gently toward the shoulders: The whiteness and delicacy of its skin should be continued, or rather go on improving to the bosom. The skin in general should be white, properly tinged with red; with an apparent softness, and a look of thriving health in it. The shoulders should be white, gently spread, and with a much softer appearance of strength than in those of men. The arm should be white, round, firm, and soft; and more particularly so from the elbow to the hands. The hand should unite insensibly with the arm; just as it does in the statue of the Venus of Medici. They should be long and delicate, and even the joints and nervous parts of them should be without either any hardness or dryness. The fingers should be fine, long, round, and soft; small, and lessening towards the tips of them: And the nails long, rounded at the ends, and pellucid. The bosom should be white and charming; and the breasts equal in roundness, whiteness, and firmness; neither too much elevated nor too much depressed; rising gently, and very distinctly separated; in one word, just like those of the Venus of Medici. The sides should be long, and the hips wider than the shoulders; and should turn off as they do in the same Venus; and go down rounding and lessening gradually to the knee. The knee should be even, and well rounded; the legs straight, but varied by a proper rounding of the more fleshy part of them, and the feet finely turned, white, and little.

Beauty. bout the waist and stomach, to acquire a disproportion that nature never meant in her shape.

The two other constituent parts of beauty, are expression and grace; the former of which is common to all persons and faces; and the latter is to be met with in very few.

3. *Expression.* By this is meant the expression of the passions; the turns and changes of the mind, so far as they are made visible to the eye by our looks or gestures.

Though the mind appears principally in the face and attitudes of the head; yet every part almost of the human body, on some occasion or other, may become expressive. Thus the languishing hanging of the arm, or the vehement exertion of it; the pain expressed by the fingers of one of the sons in the famous group of Laocoon, and in the toes of the dying gladiator. But this again is often lost among us by our dress; and indeed is of the less concern, because the expression of the passions passes chiefly in the face, which we (by good luck) have not as yet concealed.

The parts of the face in which the passions most frequently make their appearance, are the eyes and mouth; but from the eyes they diffuse themselves very strongly about the eye-brows; as, in the other case, they appear often in the parts all round the mouth.

Philosophers may dispute as much as they please about the seat of the soul; but where-ever it resides, we are sure that it speaks in the eyes. Perhaps it is injuring the eye-brows, to make them only dependents on the eye; for they, especially in lively faces, have, as it were, a language of their own; and are extremely varied, according to the different sentiments and passions of the mind.

Degree of pleasure may be often discerned in a lady's eye-brow, though she have address enough not to let it appear in her eyes; and at other times may be discovered so much of her thoughts, in the line just above her eye-brows, that she would probably be amazed how any body could tell what passed in her mind, and (as she thought) undiscovered by her face, so particularly and distinctly.

Homer makes the eye-brows the seat of (D) majesty, Virgil of (E) dejection, Horace of (F) modesty, and Juvenal of (G) pride; and it is not certain whether every one of the passions be not assigned, by one or other of the poets, to the same part.

Beauty. Having hitherto spoken only of the passions in general, we will now consider a little which of them add to beauty, and which of them take from it.

We may say, in general, that all the tender and kind passions add to beauty; and all the cruel and unkind ones add to deformity: And it is on this account that good nature may very justly be said to be "the best feature even in the finest face."

Mr Pope has included the principal passion of each sort in two very pretty lines:

Love, hope, and joy, fair pleasure's smiling train;
Hate, fear, and grief, the family of pain.

The former of which naturally give an additional lustre and enlivening to beauty; as the latter are too apt to fling a gloom and cloud over it.

Yet in these, and all the other passions, moderation ought perhaps to be considered in a great measure the rule of their beauty, almost as far as moderation in actions is the rule of virtue. Thus an excessive joy may be too boisterous in the face to be pleasing; and a degree of grief in some faces, and on some occasions, may be extremely beautiful. Some degrees of anger, shame, surprise, fear, and concern, are beautiful; but all excess is hurtful, and all excess ugly. Dulness, austerity, impudence, pride, affectation, malice, and envy, are always ugly.

The finest union of passions that can perhaps be observed in any face, consists of a just mixture of modesty, sensibility, and sweetness; each of which when taken singly is very pleasing: but when they are all blended together, in such a manner as either to enliven or correct each other, they give almost as much attraction as the passions are capable of adding to a very pretty face.

The prevailing passion in the Venus of Medici is modesty: It is expressed by each of her hands, in her looks, and in the turn of her head. And by the way, it may be questioned, whether one of the chief reasons why side-faces please one more than full ones, be not from the former having more of the air of modesty than the latter. This at least is certain, that the best artists usually choose to give a side-face rather than a full one; in which attitude, the turn of the neck too has more beauty, and the passions more activity and force. Thus, as to hatred and affection in particular, the look that was formerly supposed to carry an infection with it from malignant eyes, was a slanting regard; like that which

(D) Η, ἡ χυανησιν ἐπ' ὀφρυσίνευσεν Κρονίων·
Ἀμύροισι δ' ἀπ' αἰσῶν ἐπὶ πρῶτον ἀνακλῶς
Κραῖος ἀπ' ἀθανάτοιο μέγαν δ' ἐλπίδ' Ὀλύμπου. *Il.* α. 528.

It was from this passage that Phidias borrowed all the ideas of that majesty which he had expressed so strongly in his famous statues of the Jupiter Olympus; and Horace, probably, his—*Cuncta supercilio moventis.*
Lib. iii. Od. i. 8.

(E) *Frons læta parum, et dejecto lumina vultu.* *Virgil, Æn. vi. 863.*

(F) *Deme supercilio nubem; plerumque modestus*
Occupat obscuri speciem. *Horat. lib. i. Epist. 18. 95,*

(G) *Malo Venufinam, quam te, Cornelia, mater*
Gracchorum; si cum magnus virtutibus affers
Grande supercilium, et numeras in dote triumphos. *Juvenal, Sat. vi. 168.*

It is here that the Romans used the word *superciliosus* (as we do from it the word *supercilious*) for proud and arrogant persons.

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which Milton gives to Satan, when he is viewing the happiness of our first parents in paradise; and the fascination, or stroke of love, is most usually conveyed, at first, in a side-glance.

It is owing to the great force of pleasingness which attends all the kinder passions, "that lovers do not only seem, but are really, more beautiful to each other than they are to the rest of the world;" because when they are together, the most pleasing passions are more frequently exerted in each of their faces than they are in either before the rest of the world. There is then (as a certain French writer very well expresses it) "A soul upon their countenances," which does not appear when they are absent from each other; or even when they are together conversing with other persons, that are indifferent to them, or rather lay a restraint upon their features.

The superiority which the beauty of the passions has over the two parts of beauty first mentioned, will probably be now pretty evident: or if this should appear still problematical to any one, let him consider a little the following particulars, of which every body must have met with several instances in their lifetime. That there is a great deal of difference in the same face, according as a person is in a better or worse humour, or in a greater or less degree of liveliness: That the best complexion, the finest features, and the exactest shape, without any thing of the mind expressed on the face, are as insipid and unmoving as the waxen figure of the fine Dukes of Richmond in Westminster-Abbey: That the finest eyes in the world, with an excess of malice or rage in them, will grow as shocking as they are in that fine face of Medusa on the famous seal in the Strozzi family at Rome: That a face without any good features in it, and with a very indifferent complexion, shall have a very taking air; from the sensibility of the eyes, the general good-humoured turn of the look, and perhaps a little agreeable smile about the mouth. And these three things perhaps would go a great way toward accounting for the *Je ne sçai quoi*, or that inexplicable pleasingness of the face (as they choose to call it), which is so often talked of and so little understood; as the greater part, and perhaps all the rest of it, would fall under the last article, that of grace.

Thus it appears that the passions can give beauty without the assistance of colour or form; and take it away where they have united the most strongly to give it. And hence the superiority of this part of beauty to the other two.

This, by the way, may help us to account for the justness of what Pliny asserts in speaking of the famous statue of Laocoon and his two sons: He says, it was the finest piece of art in Rome; and to be preferred to all the other statues and pictures, of which they had so noble a collection in his time. It had no beauties of colour to vie with the paintings and other statues there; as the Apollo Belvedere and the Venus of Medici, in particular, were as finely proportioned as the Laocoon: But this had much greater variety of expression even than those fine ones; and it must be on that account alone that it could have been preferable to them and all the rest.

Before quitting this head, two things before men-

tioned deserve to be repeated: That the chief rule of the beauty of the passions is moderation; and that the part in which they appear most strongly is the eyes. It is there that love holds all his tenderest language: It is there that virtue commands, modesty charms, joy enlivens, sorrow engages, and inclination fires the hearts of the beholders: It is there that even fear, and anger, and confusion, can be charming. But all these, to be charming, must be kept within their due bounds and limits; for too sullen an appearance of virtue, a violent and prostitute swell of passion, a rustic and overwhelming modesty, a deep sadness, or too wild and impetuous a joy, become all either oppressive or disagreeable.

4. The last finishing and noblest part of beauty is *Grace*; which every body is accustomed to speak of as a thing inexplicable; and in a great measure perhaps it is so. We know that the soul is, but we scarce know what it is: every judge of beauty can point out grace; but no one seems even yet to have fixed upon a definition for it.

Grace often depends on some very little incidents in a fine face; and in actions it consists more in the manner of doing things than in the things themselves. It is perpetually varying its appearance, and is therefore much more difficult to be considered than in any thing fixed and steady. While you look upon one, it steals from under the eye of the observer; and is succeeded perhaps by another that flits away as soon and as imperceptibly. It is on this account that grace is better to be studied in Corregio's, Guido's, and Raphael's pictures, than in real life.

But though one cannot punctually say what grace is, we may point out the parts and things in which it is most apt to appear.

The chief dwelling-place of grace is about the mouth; though at times it may visit every limb or part of the body. But the mouth is the chief seat of grace, as much as the chief seat for the beauty of the passions is in the eyes. Thus, when the French use the expression of *une bouche fort gracieuse*, they mean it properly of grace: but when they say, *des yeux tres gracieux*, it then falls to the share of the passions; and it means kind or favourable.

In a very graceful face, by which we do not so much mean a majestic as a soft and pleasing one, there is now and then (for no part of beauty is either so engaging or so uncommon) a certain deliciousness that almost always lives about the mouth, in something not quite enough to be called a smile, but rather an approach toward one, which varies gently about the different lines there like a little fluttering Cupid, and perhaps sometimes discovers a little dimple, that after just lightening upon you disappears and appears again by fits.

The grace of attitudes may belong to the position of each part, as well as to the carriage or disposition of the whole body: but how much more it belongs to the head than to any other part may be seen in the pieces of the most celebrated painters; and particularly in those of Guido, who has been rather too lavish in bestowing this beauty on almost all his fine women; whereas nature has given it in so high a degree but to very few.

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The terms of the neck are extremely capable of grace, and are very easy to be observed, though very difficult to be accounted for.

How much of this grace may belong to the arms and feet, as well as to the neck and head, may be seen in dancing. But it is not only in genteel motions that a very pretty woman will be graceful; and Ovid (who was so great a master in all the parts of beauty) had very good reason for saying, That when Venus, to please her gallant, imitated the hobbling gait of her husband, her very lameness had a great deal of prettiness and grace in it.

“Every motion of a graceful woman (says another writer of the same age) is full of grace.” She designs nothing by it perhaps, and may even not be sensible of it herself: and indeed she should not be so too much; for the moment that any gesture or action appears to be affected, it ceases to be graceful.

Horace and Virgil seem to extend grace so far as to the flowing of the hair, and Tibullus even to the dress of his mistress; but then he assigns it more to her manner of putting on and appearing in whatever she wears than to the dress itself. It is true, there is another wicked poet (Ovid) who has said (with much less decency) “that dress is the better half of the woman;”

— *Pars minima est ipsa puella sui.*

Ovid.

There are two very distinct (and, as it were, opposite) sorts of grace; the majestic and the familiar. The former belongs chiefly to the very *fine* women, and the latter to the very *pretty* ones: *That* is more commanding, and *this* the more delightful and engaging. The Grecian painters and sculptors used to express the former most strongly in the looks and attitudes of their Minervas, and the latter in those of Venus.

Xenophon, in his Choice of Hercules (or at least the excellent translator of that piece), has made just the same distinction in the personages of wisdom and pleasure; the former of which he describes as moving on to that young hero with the majestic sort of grace; and the latter with the familiar:

Graceful, yet each with different grace they move;
This striking sacred awe, that softer winning love.

No poet seems to have understood this part of beauty so well as our own Milton. He speaks of these two sorts of grace very distinctly; and gives the majestic to his Adam, and both the familiar and majestic to Eve; but the latter in a less degree than the former:

Two of far nobler shape, erect and tall,
Godlike erect, with native honour clad,
In naked majesty, seem'd lords of all;
And worthy seem'd. For in their looks divine
The image of their glorious Maker shone:
Truth, wisdom, sanctitude severe and pure;
Severe, but in true filial freedom plac'd;
Whence true authority in men: Though both
Not equal, as their sex not equal, seem'd.
For contemplation he, and valour, form'd;
For softness she, and sweet attractive grace.

Milton's Par. Lost, B. iv. 298.

— I espy'd thee, fair indeed and tall,
Under a plantain; yet methought less fair,
Less winning soft, less amiably mild,
Than that smooth wat'ry image—

(*Eve, of Adam and herself*) *Ib. ver. 480.*

— Her heav'nly form
Angelic, but more soft and feminine;
Her graceful innocence; her ev'ry air
Of gesture, or least action.—

B. ix. 461.

Grace was in all her steps: Heav'n in her eye;
In every gesture, dignity and love.

B. viii. 489.

Speaking or mute, all comeliness and grace
Attends thee; and each word, each motion, forms.

Ib. 223.

Though grace is so difficult to be accounted for in general, yet there are two particular things which seem to hold universally in relation to it.

The first is, “That there is no grace without motion;” that is, without some genteel or pleasing motion, either of the whole body or of some limb, or at least of some feature. And it may be hence that Lord Bacon calls grace by the name of decent motion; just as if they were equivalent terms: “In beauty, that of favour is more than that of colour; and that of gracious and decent motion, more than that of favour.”

Works,
vol. iii.
p. 362.

Virgil in one place points out the majesty of Juno, *Æn. i. 46.* and in another the graceful air of Apollo, by only saying that they move; and possibly he means no more when he makes the motion of Venus the principal thing by which Æneas discovers her under all her disguise; though the commentators, as usual, would find out a more dark and mysterious meaning for it. *Æn. i. 406.*

All the best statues are represented as in some action or motion; and the most graceful statue in the world (the Apollo Belvedere) is so much so, that when one faces it at a little distance, one is almost apt to imagine that he is actually going to move on toward you.

All graceful heads, even in the portraits of the best painters, are in motion; and very strongly on those of Guido in particular; which are all either casting their looks up toward heaven, or down toward the ground, or side-way, as regarding some object. A head that is quite unactive, and slung flat upon the canvas (like the faces on medals after the fall of the Roman empire, or the Gothic heads before the revival of the arts), will be so far from having any grace, that it will not even have any life in it.

The second observation is, “That there can be no grace with impropriety;” or, in other words, that nothing can be graceful that is not adapted to the characters of the person.

The graces of a little lively beauty would become ungraceful in a character of majesty; as the majestic airs of an empress would quite destroy the prettiness of the former. The vivacity that adds a grace to beauty in youth would give an additional deformity to old age; and the very same airs which would be charming on some occasions may be quite shocking when extremely mistimed or extremely misplaced.

The inseparable union of propriety and grace seems to have been the general sense of mankind, as we may guess from the languages of several nations; in which

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Beauty. some words that answer to our proper or becoming, are used indifferently for beautiful or graceful. Thus, among the Greeks, the words *Περαιον* and *Καλον*, and among the Romans *pulchrum* and *decens*, or *decorum*, are used indifferently for one another.

It appears wrong, however, to think (as some have done) that grace consists entirely in propriety; because propriety is a thing easy enough to be understood, and grace (after all we can say about it) very difficult. Propriety, therefore, and grace are no more one and the same thing than grace and motion are. It is true, it cannot subsist without either; but then there seems to be something else, which cannot be explained, that goes to the composition, and which possibly may give its greatest force and pleasingness.

Whatever are the causes of it, this is certain, that grace is the chief of all the constituent parts of beauty; and so much so, that it seems to be the only one which is absolutely and universally admired: All the rest are only relative. One likes a brunette beauty better than a fair one; I may love a little woman, and you a large one, best; a person of a mild temper will be fond of the gentler passions in the face, and one of a bolder cast may choose to have more vivacity and more vigorous passions expressed there: But grace is found in few, and is pleasing to all. Grace, like poetry, must be born with a person, and is never wholly to be acquired by art. The most celebrated of all the ancient painters was Apelles; and the most celebrated of all the modern Raphael: And it is remarkable, that the distinguishing character of each of them was grace. Indeed, that alone could have given them so high a pre-eminence over all their other competitors.

Grace has nothing to do with the lowest part of beauty or colour; very little with shape, and very much with the passions; for it is she who gives their highest zest, and the most delicious part of their pleasingness to the expressions of each of them.

All the other parts of beauty are pleasing in some degree, but grace is pleasingness itself. And the old Romans in general seem to have had this notion of it, as may be inferred from the original import of the names which they used for this part of beauty: *Gratia* from *gratus*, or "pleasing;" and *decor* from *decens*, or "becoming."

The Greeks as well as the Romans must have been of this opinion; when in settling their mythology, they made the graces the constant attendants of Venus or the cause of love. In fact, there is nothing causes love so generally and so irresistibly as grace. It is like the Cestus of the same goddess, which was supposed to comprehend every thing that was winning and engaging in it; and beside all, to oblige the heart to love by a secret and inexplicable force like that of some magic charm.

She said, with awe divine, the queen of love.
Obey'd the sister and the wife of Jove:
And from her fragrant breast the zone unbrac'd,
With various skill and high embroidery grac'd.
In this was every art, and every charm,
To win the wisest, and the coldest warm:
Fond love, the gentle vow, the gay desire,
The kind deceit, the still reviving fire.

Persuasive speech, and more persuasive sighs,
Silence that spoke, and eloquence of eyes.
This on her hand the Cyprian goddess laid;
Take this, and with it all thy wish, she said:
With smiles she took the charm; and smiling prest
The powerful Cestus to her snowy breast.

Pope, II. xiv. 256.

Although people in general are more capable of judging right of beauty, at least in some parts of it, than they are of most other things; yet there are a great many causes apt to mislead the generality in their judgments of beauty. Thus, if the affection is entirely engaged by any one object, a man is apt to allow all perfections to that person, and very little in comparison to any body else; or if they ever commend others highly, it is for some circumstance in which they bear some resemblance to their favourite object.

Again, people are very often misled in their judgments, by a similitude either of their own temper or personage in others. It is hence that a person of a mild temper is more apt to be pleased with the gentler passions in the face of his mistress; and one of a very lively turn would choose more of spirit and vivacity in his; that little people are inclined to prefer pretty women, and larger people majestic ones; and so on in a great variety of instances. This may be called falling in love with ourselves at second hand; and self-love (whatever other love may be) is sometimes so false-sighted, that it may make the most plain, and even the most disagreeable things, seem beautiful and pleasing.

Sometimes an idea of usefulness may give a turn to our ideas of beauty; as the very same things are reckoned beauties in a coach-horse which would be so many blemishes in a race-horse.

But the greatest and most general misleader of our judgments, in relation to beauty, is custom, or the different national tastes for beauty, which turn chiefly on the two lower parts of it, colour and form.

It was from the most common shape of his countrywomen, that Rubens, in his pictures, delights so much in plumpness; not to give it a worse name. Whenever he was to represent the most beautiful women, he is sure to give them a good share of corpulence. It seems as if nobody could be a beauty with him under two hundred weight. His very graces are all fat.

But this may go much farther than mere bulk; it will reach even to very great deformities; which sometimes grow into beauties, where they are habitual and general. One of our own countrymen (who was a particularly handsome man) in his travelling over the Alps, was detained by a fever in one of those villages, where every grown person has that sort of swellings in the neck which they call *goitres*; and of which some are very near as big as their heads. The first Sunday that he was able, he went to their church (for he was a Roman catholic) to return thanks to heaven for his recovery. A man of so good a figure, and so well dressed, had probably never before been within the walls of that chapel. Every body's eyes were fixed upon him: and as they went out, they cried out loud enough for him to hear them, "O how completely handsome would that man be, if he had but a *goitre*!"

In some of the most military nations of Africa, no man is reckoned handsome that has not five or six scars

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in his face. This custom might possibly at first be introduced among them to make them less afraid of wounds in that part in battle: but however that was, it grew at last to have so great a share in their idea of beauty, that they now cut and slash the faces of their poor little infants, in order to give them those graces, when they are grown up, which are so necessary to win the hearts of their mistresses; and which, with the assistance of some jewels or ingots of gold in their noses, ears, and lips, must certainly be irresistible to the ladies of that country.

The covering each cheek all over with a burning sort of red colour, has long been looked upon in a neighbouring country to be as necessary to render a fine lady's face completely beautiful, as these scars are for the beaux in Africa.

The natural complexion of the Italian ladies is of a higher glow than ours usually are; and yet Mr Addison is very just, in making a Numidian call the ladies of the same country *pale, unripened beauties*.

The glowing dames of Zama's royal court
Have faces flushed with more exalted charms:
The sun, that rolls his chariot o'er their heads,
Works up more fire and colour in their cheeks:
Were you with these, my prince, you'd soon forget
The pale, unripen'd beauties of the north!

Syphax to Juba; in Cato, Act i. Scene 4.

The prince of Anamaboo, who had been so long and laterally so much used to the European complexion, yet said of a certain lady a little before he left London, "That she would be the most charming woman in the world if she was but a negro."

In an account of some of the farthest travellers that any of our people have made up the river Gambia, we are informed, that when they came to some villages where probably no Europeans had ever been before, the women ran frightened and screaming from them, on taking them to be devils, merely on account of the whiteness of their complexion.

We cannot avoid observing, however, that heaven is very good and merciful to mankind, even in making us capable of all this variety of mistakes. If every person judged exactly right of beauty, every man that was in love in such a district, would be in love with the same woman. The superior beauty of each hamlet would be the object of the hate and malice of all the rest of her own sex in it, and the cause of dissension and murders among all of the other. If this would hold in one town, it would hold for the same reasons in every other town or district; and of course there would be nothing more wanting than this universal right judgment of beauty, to render the whole world one continued scene of blood and misery.

But now that fancy has herhaps more to do with beauty than judgment, there is an infinity of tastes, and consequently an infinity of beauty; for to the mind of the lover, supposed beauty is full as good as real. Every body may now choose out what happens to hit his own turn and cast. This increases the extent of beauty vastly, and makes it in a manner universal: for there are but few people in comparison that are truly beautiful; but every body may be beautiful in the imagination of some one or other. Some may delight themselves in a black skin, and others in a white;

some in a gentle natural rofiness of complexion, others in a high exalted artificial red; some nations in waists disproportionably large, and another in waists as disproportionably small. In short, the most opposite things imaginable may each be looked upon as beautiful in whole different countries, or by different people in the same country.

We should perhaps make a distinction here again, as to the two former parts of beauty and the two latter. Fancy has much more to do in the articles of form and colour than in those of the passions and grace. The good passions, as they are visible on the face, are apparent goodness; and that must be generally amiable; and true grace, wherever it appears to any degree, one should think must be pleasing to every human creature; or perhaps this may never appear in the women of any nation, where the men are grown so savage and brutal as to have lost all taste for it.

Yet even as to grace itself, under the notion of pleasingness, it may become almost universal, and be as subject to the dominion of fancy as any of the less significant parts of beauty. A parent can see genteelness in the most awkward child perhaps that ever was born; and a person who is truly in love, will be pleased with every motion and air of the person beloved; which is the most distinguishing character that belongs to grace. It is true, this is all a mistaken grace; but as to that particular person, it has all the effects of the true.

BEAUTY, in architecture, painting, and other arts, is the harmony and justness of the whole composition taken together.

BEAUVAIS, an episcopal city in the Isle of France, and capital of the Beauvoisis. The cathedral church is dedicated to St Peter, and is much admired for its fine architecture. It contains a great number of relics, and a library of curious books. There are several other churches, among which is one dedicated to St Stephen, remarkable for its curious windows. The town was ineffectually besieged by the English in 1443, and by the duke of Burgundy with an army of 80,000 men. In this last siege the women signalized themselves under the conduct of Jeane Hachette, who set up a standard yet preserved in the church of the Jacobins. The duke was obliged to raise the siege; and in memory of the womens exploits, they walk first in a procession on the 10th of July, the anniversary of their deliverance. The inhabitants carry on a good trade in beautiful tapestry. Beauvais is situated on the river Therin, in E. Long. 2. 15. N. Lat. 49. 26.

BEAUVAIS, a town of France in Upper Languedoc, seated on the river Tescou. E. Long. 1. 43. N. Lat. 44. 2.

BEAUVIN, a city of Burgundy in France, in E. Long. 4. 50. N. Lat. 47.

BEAUVOIR *sur Mer*, a maritime town of Poitou, in France, with the title of Marquisate. W. Long. 1. 5. N. Lat. 46. 45.

BEAUVOISIS, a territory of France, formerly part of Picardy, but now of the Isle of France. Beauvais is the capital.

BEBELINGUEN, a town of Germany, in the duchy of Wirtemberg, seated on a lake from which proceeds the river Worm. E. Long. 9. 8. N. Lat. 48. 45.

BEBRYCIA (anc. geog.), an ancient name of Bithynia,

Beauty

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Bebrycia.

Bec
||
Beck.

Bithynia, so called from the Bebryces its inhabitants. The Bebryces were afterwards driven out by the Thracians, viz. the Bithyni and Thyni; from whom, in process of time, the country took the name of *Bithynia*. See BITHYNIA.

BEC, a town of France, in Normandy, seated on a tongue of land, at the confluence of two rivers, in E. Long. 0. 52. N. Lat. 48. 45.

BECAH, or BEKAH, a Jewish coin, being half a shekel. In Dr Arbuthnot's table of reductions, the bekah amounts to $13\frac{1}{8}$ d. in Dr Prideaux's computation to 1 s. 6 d. Every Israelite paid an hundred bekahs a head annually for the support of the temple.

BECALM, in a general sense, signifies to appease, to allay.

BECALM, in the sea language. A ship is said to be becalmed, when there is not a breath of wind to fill the sails.

BECANOR, a town of India, in Asia, seated on the river Ganges, in E. Long. 83. 5. N. Lat. 27. 40.

BECCABUNGA, BROOKLIME; the trivial name of a species of veronica. See VERONICA.

BECCLES, a large town of Suffolk in England, in E. Long. 1. 30. N. Lat. 52. 38.

BECHER (John Joachim), a celebrated chemist, was born at Spire, in 1645. He was connected with the most learned men in Europe; and the emperor, the electors of Mentz and Bavaria, and other persons of high rank, furnished him with the means of making experiments in mathematics, natural philosophy, medicine, and chemistry. As his thoughts were very judicious and uncommon with respect to economy and to increasing the revenues of a state, he was invited to Vienna, where he contributed greatly to the establishment of several manufactures, a chamber of commerce, and an India company; but the jealousy of some of the ministers occasioned his disgrace and ruin. He was not less unhappy at Mentz, Munich, and Wurtzburg; which determined him to go to Haerlem, where he invented a machine for working a great quantity of silk in a little time, and with few hands: but new misfortunes made him come to England, and he died at London in 1685. He wrote many works; the principal of which are, 1. *Physica Subterranea*, which was reprinted at Leipzig in 1703, and in 1739, in octavo, with a small treatise, by E. Stahl, intitled *Specimen Becherianum*. 2. *Experimentum chymicum novum*, 8vo. 3. *Character pro Notitia Linguarum universalis*. 4. *Institutiones Chymicae, seu Manuductio ad Philosophiam Hermeticam*, 4to. 5. *Institutiones Chymicae prodromae*, 12mo. 6. *Experimentum novum ac curiosum de Minera arenaria perpetua*, &c.

BECHIN, a town of Bohemia, in a circle of the same name. It was taken and burnt by General Bequoi in 1619. It is seated on the river Lausnitz, in E. Long. 15. 12. N. Lat. 49. 14.

BECK, or BEKE, a word which imports a small stream of water issuing from some burn or spring. Hence *Hell-becks*, little brooks in the rough and wild mountains about Richmond near Lancashire, so called on account of their ghastriness and depth.

BECK is chiefly used among us in the composition of names of places originally situated on rivulets: hence Walbeck, Bournbeck, &c. The Germans use *beck* in the same manner.

BECK (David), an eminent portrait-painter, was born at Arnheim in Guelderland in 1621, and became a disciple of Vandyck; from whom he acquired a fine manner of penciling, and that sweet style of colouring which is peculiar to that great master and to all the disciples trained up under his direction. He possessed besides, that freedom of hand, and readiness, or rather rapidity of execution, for which Vandyck was so remarkably famous; and King Charles I. when he observed the expeditious manner of Beck's painting, was so exceedingly surprised, that he told Beck, it was his opinion, he could paint if he was riding post. He was appointed portrait-painter and chamberlain to Queen Christina of Sweden; and by her recommendation, most of the illustrious persons in Europe sat to him for their pictures. He was agreeable, handsome, and polite, and lived in the highest favour with his royal mistress: but, having an earnest desire to visit his friends in Holland, and leaving the court of Sweden much against the Queen's inclination, she apprehended that he intended never to return; and, as he died soon after at the Hague, it was suspected that he was poisoned. This happened in 1656, when he was aged only 35 years.—A very singular adventure happened to this painter as he travelled through Germany, which seems not unworthy of being recited. He was suddenly and violently taken ill at the inn where he lodged, and was laid out as a corpse, seeming to all appearance quite dead. His valets expressed the strongest marks of grief for the loss of their master, and while they sat beside his bed, they drank very freely, by way of consolation. At last one of them, who grew much intoxicated, said to his companions, our master was fond of his glass while he was alive, and out of gratitude let us give him a glass now he is dead. As the rest of the servants assented to the proposal, he raised up the head of his master and endeavoured to pour some of the liquor into his mouth. By the fragrance of the wine, or probably by a small quantity that imperceptibly got down his throat, Beck opened his eyes; and the servant being excessively drunk, and forgetting that his master was considered as dead, compelled him to swallow what wine remained in the glass. The painter gradually revived, and by proper management and care recovered perfectly, and escaped a premature interment.—How highly the works of this master were esteemed, may appear from the many marks of distinction and honour which were shown him; for he received from different princes, as an acknowledgment of his singular merit, nine gold chains, and several medals of gold of a large size.

BECKET (Thomas), lord chancellor of England, archbishop of Canterbury in the 12th century. The story of his birth is as extraordinary as that of his life. It is related, that his father Gilber Becket, some time sheriff of London, went on a pilgrimage to Jerusalem, where being surprised and enslaved by a party of Saracens, his master's daughter fell in love with him; and that when he made his escape, she followed him to London. So singular an instance of heroic affection struck him; and after consulting with some bishops, he baptized her by the name of *Matilda*, and married her; from which marriage proceeded the haughty Thomas Becket. Being raised to the archbishopric, he began the:

Beck,
Becket.

Becket.

the great dispute between the crown and the mitre, and sided with the pope: at which King Henry II. was greatly offended; and calling an assembly of the bishops at Westminster, offered six articles against papal encroachments, which he urged Becket to assent to. Becket, at the importunities of several lords, signed them; but relapsing, he was ordered to be tried as a traitor; upon which he fled into Flanders. The king banished all his relations, and Becket excommunicated all his opposers. At last, after seven years, by the intercession of the French king and the pope, he returned; but refused to absolve these bishops and others he had excommunicated: whereupon the king grew enraged; and is reported to have dropped these expressions: "That he was an unhappy prince, who maintained a great number of lazy insignificant persons about him, none of whom had gratitude or spirit enough to revenge him on a single insolent prelate who gave him so much disturbance." These words of the king put four gentlemen of his court on forming a design against the archbishop's life, which they executed in the cathedral church of Canterbury, on the 29th of December 1171. They endeavoured to drag him out of the church; but finding they could not do this without difficulty, killed him there. The assassins being afraid they had gone too far, durst not return to the king's court at Normandy, but retired to Knaresburgh in Yorkshire; where every body avoided their company, hardly any person even choosing to eat or drink with them. They at length took a voyage to Rome, and being admitted to penance by Pope Alexander III. they went to Jerusalem; where, according to the pope's order, they spent their lives in penitential austerities, and died in the Black Mountain. They were buried at Jerusalem, without the church door belonging to the Templars. King Henry was, or affected to be, much disturbed at the news of Becket's death, and dispatched an embassy to Rome to clear himself from the imputation of being the cause of it. Immediately all divine offices ceased in the church of Canterbury, and this for a year, excepting nine days; at the end of which, by order of the pope, it was reconsecrated. Two years after, Becket was canonized; and the following year, Henry returned to England, went to Canterbury, where he did penance as a testimony of his regret for the murder of Becket. When he came within sight of the church where the archbishop was buried, he alighted off his horse, and walked barefoot, in the habit of a pilgrim, till he came to Becket's tomb; where, after he had prostrated himself and prayed for a considerable time, he submitted to be scourged by the monks, and passed all that day and night without any refreshment, and kneeling upon the bare stone. In 1221 Becket's body was taken up, 50 years after his murder, in the presence of king Henry III. and a great concourse of the nobility and others, and deposited in a rich shrine, erected at the expence of Stephen Langton archbishop of Canterbury, which was soon visited from all parts, and enriched with the most costly gifts and offerings; and the miracles said to be wrought at his tomb were so numerous, that Gervase of Canterbury tells us, there were two large volumes of them kept in that church. The monks used to raise his body every year; and the day on which this ceremony was performed, which was called the *day of*

his translation, was a general holiday: every 50th year there was celebrated a jubilee to his honour, which lasted 15 days: plenary indulgences were then granted to all that visited his tomb; and 100,000 pilgrims have been registered at a time in Canterbury. The devotion towards him had quite effaced in that town the adoration of the Deity; nay, even that of the virgin. At God's altar, for instance, there were offered in one year 3 l. 2 s. 6 d. at the Virgin's, 63 l. 5 s. 6 d. at St Thomas's, 832 l. 12 s. 3 d. But next year the disproportion was still greater: there was not a penny offered at God's altar; the Virgin's gained only 4 l. 1 s. 8 d. but St Thomas's had got for his share 954 l. 6 s. 3 d. Louis VII. of France had made a pilgrimage to this miraculous tomb, and had bestowed on the shrine a jewel which was esteemed the richest in Christendom. Henry VIII. to whom it may easily be imagined how obnoxious a saint of this character behoved to appear, and how much contrary to all his projects for degrading the authority of the court of Rome, not only pilaged the rich shrine dedicated to St Thomas, but made the saint himself be cited to appear in court, and be tried and condemned as a traitor: he ordered his name to be struck out of the calendar; the office for his festival to be expunged from all breviaries; and his bones to be burnt, and the ashes thrown in the air. From Mr Thomas Warton we learn, that Becket was the subject of poetical legends. *The Lives of the Saints* in verse, in Bennet's library (Number CLXV.), contain his martyrdom and translation. This manuscript is supposed to be of the 14th century. The same ingenious writer informs us, from Peter de Blois, that the palace of Becket was perpetually filled with bishops highly accomplished in literature, who passed their time there in reading, disputing, and deciding important questions of the state. "These prelates, though men of the world, were a society of scholars; yet very different from those who frequented the universities in which nothing was taught but words and syllables, unprofitable subtleties, elementary speculations, and trifling distinctions. De Blois was himself eminently learned, and one of the most distinguished ornaments of Becket's attendants. We know that John of Salisbury, his intimate friend, the companion of his exile, and the writer of his life, was scarcely exceeded by any man of his time for his knowledge in philological and polite literature."

BECKINGHAM (Charles), an English dramatic writer, was the son of a linen-draper in London, and born in 1699. He was educated at that great nursery of learning Merchant-Taylor's school, under the learned Dr Smith, where he made a very great proficiency in all his studies, and gave the strongest testimonials of very extraordinary abilities. In poetry more particularly he very early discovered an uncommon genius, two dramatic pieces of his writing being represented on the stage before he had completed his 20th year: and those not such as required the least indulgence or allowance on account of his years; but such as bore evidence to a boldness of sentiment, an accuracy of diction, an ingenuity of conduct, and a maturity of judgment, which would have done honour to a much more ripened age. The titles of his plays, both of which are tragedies, are, 1. *Henry IV. of France*. 2. *Scipio Africanus*. At the representation of the last mentioned piece,

Becket,
Beckingham.

Beckum
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Bed.

piece, which indeed was the first he wrote, his school-master Dr Smith, as a peculiar mark of distinction and regard to the merit of his pupil, gave all his boys a holiday on the afternoon of the author's benefit, in order to afford an opportunity to such of them as pleased to pay their compliments to their school-fellow on that occasion. Besides these dramatic pieces, he wrote several other poems: but his genius was not permitted any very long period to expand itself in; for he died on the 18th of February 1730, in the 32d year of his age.

BECKUM, a town of the bishopric of Munster, in Germany, seated at the source of the river Verfe, in E. Long. 8. 18. N. Lat. 51. 46.

BECSANGIL, anciently Bithynia, a province of Natolia in Asia; bounded on the north by the Black Sea; on the west, by the Sea of Marmora; on the south, by Natolia Proper: and on the east, by the province of Bolli. The principal town is Bursa.

BECTASSE, an order or sect of religious among the Turks, denominated from their founder *Beḡaṣḡ*, preacher to Sultan Amurath. All the Janizaries belonging to the Porte are of the religion of Beḡasse, being even said to have derived their origin from the founder of this sect. The habit of the Beḡasse is white: on their heads they wear white caps of several pieces, with turbans of wool twisted rope-fashion. They observe constantly the hour of prayer, which they perform in their own assemblies, and make frequent declarations of the unity of God.

BED, a convenience for stretching and composing the body on, for ease, rest, or sleep, consisting generally of feathers inclosed in a ticken case. There are varieties of beds, as a standing-bed, a settee-bed, a tent-bed, a truckle-bed, &c.

Whittaker's
History of
Manchester.

It was universally the practice, in the first ages, for mankind to sleep upon skins of beasts. It was originally the custom of the Greeks and Romans. It was particularly the custom of the ancient Britons before the Roman invasion; and these skins were spread on the floor of their apartments. Afterwards they were changed for loose rushes and heather, as the Welsh a few years ago lay on the former, and the Highlanders of Scotland sleep on the latter to this present moment. In process of time, the Romans suggested to the interior Britons the use, and the introduction of agriculture supplied them with the means, of the neater convenience of straw beds. The beds of the * Roman gentry at this period were generally filled with feathers, and those of the inns with the soft down of reeds. But for many ages the beds of the Italians had been constantly composed of straw; it still formed those of the soldiers and officers at the conquest of Lancashire; and from both, our countrymen learnt their use. But it appears to have been taken up only by the gentlemen, as the common Welsh had their beds thinly stuffed with rushes as late as the conclusion of the 12th century; and with the gentlemen it continued many ages afterwards. Straw was used even in the royal chambers of England as late as the close of the 13th. Most of the peasants about Manchester lie on chaff at present, as do likewise the common people all over Scotland: In the Highlands heath also is very generally used as bedding even by the gentry; and the repose on a heath bed has been celebrated by travellers as a peculiar luxury, su-

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* Pliny,
lib. viii.
c. 48. and
xvi. c. 36.

perior to that yielded by down: In France and Italy, straw beds remain general to this day. But after the above period, beds were no longer suffered to rest upon the ground. The better mode, that had anciently prevailed in the east, and long before been introduced into Italy, was adopted in Britain; and they were now mounted on pedestals†. This, however, was equally confined to the gentlemen. The bed still continued on the floor among the common people. And the gross custom, that had prevailed from the beginning, was retained by the lower Britons to the last; and these ground-beds were laid along the walls of their houses, and formed one common dormitory for all the members of the family. The fashion continued universally among the inferior ranks of the Welch within these four or five ages, and with the more uncivilized part of the Highlanders down to our own times. And even at no great distance from Manchester, in the neighbouring Buxton, and within these 60 or 70 years, the persons that repaired to the bath are all said to have slept in one long chamber together; the upper part being allotted to the ladies, and the lower to the gentlemen, and only partitioned from each other by a curtain.

Dining-BED, *lectus tricliniaris*, or *discubitorius*, that whereon the ancients lay at meals. The dining or discubitory beds were four or five feet high. Three of these beds were ordinarily ranged by a square table (whence both the table and the room where they eat were called *triclinium*) in such a manner, that one of the sides of the table remained open and accessible to the waiters. Each bed would hold three or four, rarely five persons. These beds were unknown before the second Punic war: the Romans, till then, sat down to eat on plain wooden benches, in imitation of the heroes of Homer, or, as Varro expresses it, after the manner of the Lacedemonians and Cretans, Scipio Africanus first made an innovation: he had brought from Carthage some of those little beds called *punicani*, or *archaici*; being of a wood common enough, very low, stuffed only with straw or hay, and covered with goats or sheeps skins, *bedinis pellibus strati*. In reality, there was no great difference, as to delicacy, between these new beds and the ancient benches; but the custom of frequent bathing, which began then to obtain, by softening and relaxing the body, put men on trying to rest themselves more commodiously by lying along than by sitting down. For the ladies, it did not seem at first consistent with their modesty to adopt the mode of lying; accordingly they kept to the old custom all the time of the commonwealth; but, from the first Cæsars, they eat on their beds. For the youth who had not yet put on the *toga virilis*, they were long kept to the ancient discipline. When they were admitted to table, they only sat on the edge of the beds of their nearest relations. Never, says Suetonius, did the young Cæsars, Caius and Lucius, eat at the table of Augustus; but they were set in *imo loco*, or, as Tacitus expresses it, *ad lecti fulcra*. From the greatest simplicity, the Romans by degrees carried their dining-beds to the most surprising magnificence. Pliny assures us, it was no new thing to see them covered over with plates of silver, adorned with the softest mats, and the richest counterpanes. Lampridius, speaking of Heliogabulus, says, he had beds of solid silver, *solido argento habuit lectos & tricliniarios, & cubiculares*. We may add, that

Bed.

† Gen. xlix.

P

that

Bed,
Beda.

that Pompey, in his third triumph, brought in beds of gold.—The Romans had also beds whereon they studied, and beds whereon the dead were carried to the funeral pile.

BED-Moulding, in architecture, a term used for those members of a cornice which are placed below the coronet; and now usually consists of an ogee, a list, a large boultine, and another list under the coronet.

BED of Justice, in the French customs, a throne upon which the king is seated when he goes to the parliament. The king never holds a bed of justice unless for affairs that concern the state, and then all the officers of parliament are clothed in scarlet robes.

BED of the Carriage of a Great Gun, a thick plank, that lies under the piece; being, as it were, the body of the carriage.

BED, in masonry, a course or range of stones; and the joint of the bed is the mortar between two stones, placed over each other.

BED, in gardening, square or oblong pieces of ground in a garden, raised a little above the level of the adjoining ground, and wherein they sow seeds or plant roots.

Hot-BED. See *HOT-BED*.

Lords of the BED-Chamber, in the British court, are 12 noblemen who attend in their turns, each a month; during which time they lie in the king's bed chamber, and wait on him when he dines in private. Their salary is 1000*l.* *per annum*.

BEDA, commonly called *Venerable Bede*, one of our most ancient historians, was born in the year 672, in the neighbourhood of Weremouth, in the bishopric of Durham. He was educated by the abbot Benedict in the monastery of St Peter, near the mouth of the river Wyre. At the age of 19 he was ordained deacon, and priest in the year 702. About this time he was invited to Rome by Pope Sergius; but there is no sufficient reason to believe that he accepted the invitation. In the year 731 he published his *Ecclesiastical History*; a work of so much merit, notwithstanding the legendary tales it contains, that it were alone sufficient to immortalize the author. He died in the year 735 of a lingering consumption, probably occasioned by a sedentary life, and a long uninterrupted application to study and literary compositions, of which he left an incredible number. He was buried in the church of his convent at Jarrow; but his bones were afterwards removed to Durham, and there deposited in the same coffin with those of St Cuthbert. Bede was undoubtedly a singular phenomenon in an ignorant and illiterate age. His learning, for the times, was extensive, his application incredible, his piety exemplary, and his modesty excessive. He was universally admired, consulted, and esteemed, during his life; and his writings are deservedly considered as the foundation of our ecclesiastical history. His language is neither elegant nor pure, but perspicuous and easy.—All his works are in Latin. The first general collection of them appeared at Paris in 1544, in three volumes in folio. They were printed again at the same place in 1554, in eight volumes. They were also published in the same size and number of volumes at Basil in 1563, reprinted at Cologne in 1612, and at the same place in 1688. Besides this general collection, there are several of his

compositions, which have been printed separately, or amongst the collections of the writings of ancient authors; and there are several manuscripts ascribed to him, which are preserved in the different libraries in Oxford and Cambridge.

BEDALL, a town in the north riding of Yorkshire. Through this town passes a Roman causeway to Richmond, Barnard-castle, &c. The parts adjacent are noted for hunting and road horses. W. Long.

1. 40. N. Lat. 54. 30.

BEDARIEUX, or *BEC D'ARIEUX*, a town of Languedoc in France, seated on the river Obe, in E. Long.

3. 24. N. Lat. 43. 29.

BEDEL. See *BEADLE*.

BEDEL, a small town in the north riding of Yorkshire, seated on a little brook, in W. Long. 1. 30. N. Lat. 54. 30.

BEDELL (Dr William), a learned prelate, born in Essex in 1570. He went with Sir Henry Wotton the English ambassador to the republic of Venice, as his chaplain, in 1604; and continuing eight years in that city, contracted an intimate acquaintance with the famous Father Paul, of whom he learned Italian so well as to translate the English Common-Prayer Book into that language: in return he drew up an English grammar for Father Paul, who declared he had learned more from him in all parts of divinity than from any one beside. He was accordingly much concerned when Bedell left Venice; and at his departure presented him with his picture, the MSS. of his *History of the Council of Trent*, his *History of the Interdict and Inquisition*, with other literary donations. In 1629, he obtained the bishopric of Kilmore and Adragh in Ireland; and finding these dioceses in great disorder, applied himself vigorously to reform the abuses there. He was no persecutor of Papists, but laboured with great success to convert the better sort of the Popish clergy: he procured an Irish translation of the common-Prayer Book, which he caused to be read in his cathedral every Sunday; and the New Testament having been translated by Archbishop Daniel, he procured one of the Old Testament; which he having been prevented from printing himself, was afterwards executed at the expence of the great Mr Robert Boyle. He published, in 1624, a controversial book against the Roman Catholics, which he dedicated to Charles prince of Wales; and assisted the archbishop of Spalatro in finishing his famous work *De Republica Ecclesiastica*.—When the bloody rebellion broke out in Ireland in Oct. 1641, the bishop at first did not feel the violence of its effects; for the very rebels had conceived a great veneration for him, and they declared he should be the last Englishman they would drive out of Ireland. His was the only house in the county of Cavan that was unviolated, and it was filled with the people who fled to him for shelter. About the middle of December, however, the rebels, pursuant to orders received from their council of state at Kilkenny, required him to dismiss the people that were with him; which he refused to do, declaring he would share the same fate with the rest. Upon this they seized him, his two sons, and Mr Clogy who had married his daughter-in-law, and carried them prisoners to the castle of Cloughboughter, surrounded by a deep water, where they put them all, except the bishop, in irons; after some time, however,

Bedall
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Bedell.

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shire.

this part of their severity was abated. After being confined for about three weeks, the bishop and his two sons, and Mr Clogy, were exchanged for some of the principal rebels: but the bishop died soon after, on the 7th of February 1642, his death being chiefly occasioned by his late imprisonment, and the weight of sorrows which lay upon his mind. The Irish did him unusual honours at his burial; for the chief of the rebels gathered their forces together, and with them accompanied his body to the church-yard.

BEDER, a strong town of Asia, in the dominions of the Great Mogul. E. Long. 81. 10. N. Lat. 16. 50.

BEDFORD, the county town of Bedfordshire in England, seated on both sides of the river Ouse, over which there is a stone bridge; in W. Long. 0. 20. N. Lat. 52. 6. It is an ancient town, and pleasantly situated, but not very large nor well built; though the buildings are much improved of late, and the river made navigable. It sends two members to parliament, and gives title of *duke* to the noble family of Russell. At this place the Britons were overthrown in a great battle in 572, by Cuthwulf the Saxon king; and here was a strong castle, built in the time of the Normans by Pagan de Beauchamp, the third Baron of Bedford. It was reduced by King Stephen after a long siege; and afterwards taken by King John, after a siege of 60 days, from Fulco de Brent, who rebelled against his sovereign, notwithstanding he had taken this castle before from the barons, and had it bestowed upon him by the king. The town is a very ancient corporation, and has long sent members to parliament. It is governed at present by a mayor, recorder, two bailiffs, twelve aldermen, two chamberlains, a town clerk, and three serjeants. The neighbouring country is very fruitful in wheat, great quantities of which are carried from hence to Hitchen and Hertford markets, sold, ground, and conveyed to London. The town has five churches, a free school, and several hospitals, and enjoys a good trade in corn by the way of Lynn. When the river is swelled by rains, especially in winter, it is usual in Cambridgeshire to say, *the bailiff of Bedford is coming*; meaning, that it is going to lay their fens under water.

BEDFORDSHIRE is a small inland county. When the Romans landed in Britain, 55 years before Christ, it was included in the district inhabited by the Catieuchlani, whose chief or governor Cassibelinus headed the forces of the whole island against Caesar, and the year following was totally defeated. In 310 the emperor Constantine divided Britain into five Roman provinces, when this county was included in the third division, called *Flavia Caesariensis*; in which state it continued 426 years, when the Romans quitted Britain. At the establishment of the kingdom of Mercia (one of the divisions of the Saxon heptarchy) it was considered as part of that kingdom; and so continued from 582 to 827, when with the other petty kingdoms of the island it became subject to the West Saxons under Egbert, and the whole was named *England*. In 889, Alfred held the sovereignty, when England was divided into counties, hundreds, and tythings, and Bedfordshire first received its present name. It is in the Norfolk circuit, the province of Canterbury, and bishopric of Lincoln. Its form is oval, being about 33 miles long, 16 broad, and nearly 73 in circumference; containing

an area of about 323 square miles, or 260,000 square acres. It supplies 400 men to the national militia. It contains 124 parishes, 58 vicarages, and 10 market-towns, *viz.* Bedford, Ampthill, Biggleswade, Dunstable, Leighton, Beaufort, Luton, Potton, Shefford, Tuddington, and Woburn, and 55 villages. The inhabitants by computation are 67,350, and it has 7,294 houses that pay taxes. It is divided into nine hundreds, sends two members to parliament, and pays seven parts of 513 of the land-tax. Its principal river, the Ouse, is navigable to Bedford; and divides the county into two parts, of which that to the south is the most considerable. In its course, which is very meandering, it receives several small streams: the principal one is the Ivel, which takes its rise in the southern part of the county. The air is healthy and the soil in general a deep clay. The north side of the Ouse is fruitful and woody, but the south side is less fertile: yet producing great quantity of wheat and barley, excellent in their kind, and woad for dyers. The soil yields plenty of fullers-earth for our woollen manufactory. The chief manufactures of the county are thread, lace, and straw ware. In this county there are many remains of Roman, Saxon, and Norman antiquities; but few Roman stations, *viz.* Sandy near Potton, and the Magiovinum of Antoninus, by others supposed to be the ancient Salenæ, containing 30 acres, where many urns, coins, &c. have been dug up. Another at Madining-bowre, or Maiden-bower, one mile from Dunstable, containing about nine acres, which Camden supposes to have been a Roman station, from the coins of the emperors having been frequently dug up there, and calls it *Magintum*. Leighton Beaufort is supposed to have been a Roman camp, and another is at Arlesey near Shefford, and a Roman amphitheatre may be traced near Bradford Magna. The Roman road, Icknield-street, crosses this county, entering at Leighton Beaufort, from whence it passes Dunstable, where it inclines northward over Warden-hills to Baldock in Hertfordshire. The Watling-street enters this county near Laton from St Albans, passes a little north of Dunstable, where it crosses the Icknield-street, and from thence to Stoney Stratford in Buckinghamshire. A Roman road also enters near Potton, passes on to Sandy, and from thence to Bedford, where it crosses the Ouse, and proceeds to Newport Pagnell in Buckinghamshire. The following antiquities in this county are worthy of notice: Bedford Bridge and Priory; Chicksand Abbey near Shefford; Dunstable Priory near Luton; Eaton Park House or Eaton Bray; Five Knolls near Dunstable; Newnham Priory near Bedford; Northill Church, three miles from Biggleswade; Summeris Tower near Luton; Warden Abbey near Shefford; Woburn Abbey; Woodhill Castle, or Oldhill Castle, near Harewood.

BEDLOE (William), who assumed the title of *Captain*, was an infamous adventurer of low birth, who had travelled over a great part of Europe under different names and disguises, and had passed among several ignorant persons for a man of rank and fortune. Encouraged by the success of Oats, he turned evidence, gave an account of Godfrey's murder, and added many circumstances to the narrative of the former. These villains had the boldness to accuse the Queen of entering into a conspiracy against the king's life. A reward of

Bedouins. 500 l. was voted to Bedloe by the Commons. He is said to have asserted the reality of the plot on his death-bed : but it abounds with absurdity, contradiction, and perjury ; and still remains one of the greatest problems in the British annals. He died at Bristol 20th August 1680. Giles Jacob informs us, that he was author of a play called *The Excommunicated Prince, or the False Relic*, 1679. The printer of it having, without the authour's knowledge, added a second title, and called it *The Popish Plot in a Play*, greatly excited the curiosity of the public, who were however much disappointed when they found the plan of the piece to be founded on a quite different story. Anth. à Wood will not allow the Captain the merit of this play ; but asserts that it was written partly, if not entirely, by one Tho. Walter, M. A. of Jesus College, Oxford.

BEDOUINS, or BEDOUIS, a modern name of the wild Arabs, whether in Asia or Africa. When speaking of the Arabs, we should distinguish whether they are cultivators or pastors ; for this difference in their mode of life occasions so great a one in their manners and genius, that they become almost foreign nations with respect to each other. In the former case, leading a sedentary life, attached to the same soil, and subject to regular governments, the social state in which they live, very nearly resembles our own. Such are the inhabitants of the Yemen ; and such also are the descendants of those ancient conquerors, who have either entirely, or in part, given inhabitants to Syria, Egypt, and the Barbary states. In the second instance, having only a transient interest in the soil, perpetually removing their tents from one place to another, and under subjection to no laws, their mode of existence is neither that of polished nations nor of savages ; and therefore more particularly merits our attention. Such are the Bedouins, or inhabitants of the vast deserts which extend from the confines of Persia to Morocco. Though divided into independent communities or tribes, not unfrequently hostile to each other, they may still be considered as forming one nation. The resemblance of their language is a manifest token of this relationship. The only difference that exists between them is, that the African tribes are of a less ancient origin, being posterior to the conquest of these countries by the khaliffs or successors of Mahomet ; while the tribes of the desert of Arabia, properly so called, have descended by an uninterrupted succession from the remotest ages. To these the orientals are accustomed to appropriate the name of *Arabs*, as being the most ancient and the purest race. The term *Bedaoui* is added as a synonymous expression, signifying, "inhabitant of the Desert."

It is not without reason that the inhabitants of the desert boast of being the purest and the best preserved race of all the Arab tribes : for never have they been conquered, nor have they mixed with any other people by making conquests ; for those by which the general name of Arabs has been rendered famous, really belong only to the tribes of the Hedjas and the Yemen. Those who dwelt in the interior of the country, never emigrated at the time of the revolution effected by Mahomet ; or if they did take any part in it, it was confined to a few individuals, detached by motives of ambition. Thus we find the prophet in his Koran continually styling the Arabs of the desert *rebels* and *infidels* ;

Bedouins. nor has so great a length of time produced any very considerable change. We may assert they have in every respect retained their primitive independence and simplicity. See ARABIA, n° 186.

The wandering life of these people arises from the very nature of their deserts. To point to himself these deserts (says M. Volney), the reader must imagine a sky almost perpetually inflamed, and without clouds, immense and boundless plains, without houses, trees, rivulets, or hills, where the eye frequently meets nothing but an extensive and uniform horizon like the sea, though in some places the ground is uneven and stony. Almost invariably naked on every side, the earth presents nothing but a few wild plants thinly scattered, and thickets, whose solitude is rarely disturbed but by antelopes, hares, locusts, and rats. Such is the nature of nearly the whole country, which extends six hundred leagues in length and three hundred in breadth, and stretches from Aleppo to the Arabian sea, and from Egypt to the Persian gulph. It must not, however, be imagined that the soil in so great an extent is every where the same ; it varies considerably in different places. On the frontiers of Syria, for example, the earth is in general fat and cultivable, nay even fruitful. It is the same also on the banks of the Euphrates : but in the internal parts of the country, and towards the south, it becomes white and chalky, as in the parallel of Damascus ; rocky, as in the Tih and the Hedjaz ; and a pure sand, as to the eastward of the Yemen. This variety in the qualities of the soil is productive of some minute differences in the condition of the Bedouins. For instance, in the more sterile countries, that is, those which produce but few plants, the tribes are feeble and very distant ; which is the case in the desert of Suez, that of the Red Sea, and the interior of the great desert called the *Najd*. When the soil is more fruitful, as between Damascus and the Euphrates, the tribes are more numerous and less remote from each other ; and, lastly, in the cultivable districts, such as the Pachalics of Aleppo, the Hauran, and the neighbourhood of Gaza, the camps are frequent and contiguous. In the former instances, the Bedouins are purely pastors, and subsist only on the produce of their herds, and on a few dates and flesh meat, which they eat either fresh or dried in the sun and reduced to a powder. In the latter, they sow some land, and add cheese, barely, and even rice, to their flesh and milk meats.

In those districts where the soil is stony and sandy, as in the Tih, the Hedjaz, and the *Najd*, the rains make the seeds of the wild plants shoot, and revive the thickets, ranunculi, wormwood, and kali. They cause marshes in the lower grounds, which produce reeds and grass ; and the plain assumes a tolerable degree of verdure. This is the season of abundance both for the herds and their masters ; but on the return of the heats, every thing is parched up, and the earth, converted into a grey and fine dust, presents nothing but dry stems as hard as wood, on which neither horses, oxen, nor even goats can feed. In this state the desert would become uninhabitable, and must be totally abandoned, had not nature formed an animal no less hardy and frugal than the soil is sterile and ungrateful. No creature seems so peculiarly fitted to the climate in which it exists. Designing the camel to dwell in a country,

Bedouins. country where he can find little nourishment, Nature (says M. Volney) has been sparing of her materials in the whole of his formation. She has not bestowed on him the plump fleshiness of the ox, horse, or elephant; but limiting herself to what is strictly necessary, she has given him a small head without ears at the end of a long neck without flesh. She has taken from his legs and thighs every muscle not immediately requisite for motion; and in short, has bestowed on his withered body only the vessels and tendons necessary to connect its frame together. She has furnished him with a strong jaw, that he may grind the hardest aliments; but lest he should consume too much, she has straitened his stomach, and obliged him to chew the cud. She has lined his foot with a lump of flesh, which sliding in the mud, and being no way adapted to climbing, fits him only for a dry, level, and sandy soil like that of Arabia: she has evidently destined him likewise to slavery, by refusing him every sort of defence against his enemies. Destitute of the horns of the bull, the hoof of the horse, the tooth of the elephant, and the swiftness of the stag, how can the camel resist or avoid the attacks of the lion, the tiger, or even the wolf? To preserve the species, therefore, nature has concealed him in the depth of the vast deserts, where the want of vegetables can attract no game, and whence the want of game repels every voracious animal. Tyranny must have expelled man from the habitable parts of the earth before the camel could have lost his liberty. Become domestic, he has rendered habitable the most barren soil the world contains. He alone supplies all his master's wants. The milk of the camel nourishes the family of the Arab under the varied forms of curd, cheese, and butter; and they often feed upon his flesh. Slippers and harness are made of his skin, tents and clothing of his hair. Heavy burdens are transported by his means: and when the earth denies forage to the horse, so valuable to the Bedouin, the she camel supplies that deficiency by her milk at no other cost, for so many advantages, than a few stalks of brambles or wormwood and pounded date kernels. So great is the importance of the camel to the desert, that were it deprived of that useful animal, it must infallibly lose every inhabitant.

Such is the situation in which nature has placed the Bedouins, to make of them a race of men equally singular in their physical and moral character. This singularity is so striking, that even their neighbours the Syrians regard them as extraordinary beings: especially those tribes which dwell in the depths of the deserts, such as the Anaza, Kaibar, Tai, and others, which never approach the towns. When in the time of Shaik Daher, some of their horsemen came as far as Acre, they excited the same curiosity there as a visit from the savages of America would among us. Every body viewed with surprise these men, who were more diminutive, meagre, and swarthy, than any of the known Bedouins. Their withered legs were only composed of tendons, and had no calves. Their bellies seemed to cling to their backs, and their hair were frizzled almost as much as that of the negroes. They on the other hand were no less astonished at every thing they saw; they could neither conceive how the houses and minarets could stand erect, nor how men ventured to dwell beneath them, and always in the same spot; but above

all, they were in an ecstasy on beholding the sea, nor could they comprehend what that desert of water could be.

We may imagine that the Arabs of the frontiers are not such novices; there are even several small tribes of them, who living in the midst of the country, as in the valley of Bekaa, that of the Jordan, and in Palestine, approach nearer to the condition of the peasants; but these are despised by the others, who look upon them as bastard Arabs and Rayas, or slaves of the Turks.

In general, the Bedouins are small, meagre, and tawny; more so, however, in the heart of the desert than on the frontiers of the cultivated country: but they are always of a darker hue than the neighbouring peasants. They also differ among themselves in the same camp; and M. Volney remarked, that the Shaiks, that is the rich, and their attendants, were always taller and more corpulent than the common class. He has seen some of them above five feet five and six inches high; though in general they do not (he says) exceed five feet two inches. This difference can only be attributed to their food, with which the former are supplied more abundantly than the latter: And the effects of this are equally evident in the Arabian and Turkmen camels; for these latter, dwelling in countries rich in forage, are become a species more robust and fleshy than the former. It may likewise be affirmed, that the lower class of Bedouins live in a state of habitual wretchedness and famine. It will appear almost incredible to us, but it is an undoubted fact, that the quantity of food usually consumed by the greatest part of them does not exceed six ounces a day. This abstinence is most remarkable among the tribes of the Najd and the Hedjaz. Six or seven dates soaked in melted butter, a little sweet milk or curds, serve a man a whole day; and he esteems himself happy when he can add a small quantity of coarse flour or a little ball of rice. Meat is reserved for the greatest festivals; and they never kill a kid but for a marriage or a funeral. A few wealthy and generous shaiks alone can kill young camels, and eat baked rice with their victuals. In times of dearth, the vulgar, always half famished, do not disdain the most wretched kinds of food; and eat locusts, rats, lizards, and serpents broiled on briars. Hence are they such plunderers of the cultivated lands and robbers on the high-roads: hence also their delicate constitution and their diminutive and meagre-bodies, which are rather active than vigorous. It may be worth while to remark, that their evacuations of every kind, even perspiration, are extremely small; their blood is so destitute of serosity, that nothing but the greatest heat can preserve its fluidity. This, however, does not prevent them from being tolerably healthy in other respects; for maladies are less frequent among them than among the inhabitants of the cultivated country.

From these facts we are by no means justified in concluding that the frugality of the Bedouins is a virtue purely of choice, or even of climate. The extreme heat in which they live unquestionably facilitates their abstinence, by destroying that activity which cold gives to the stomach. Their being habituated also to so sparing a diet, by hindering the dilatation of the stomach, becomes doubtless a means of their supporting such abstemiousness; but the chief and primary motive of this habit is with them, as with the

rest

Bedouins.

rest of mankind, the necessity of the circumstances in which they are placed, whether from the nature of the soil, as has been before explained, or that state of society in which they live, and which remains now to be examined.

It has been already remarked, that the Bedouin Arabs are divided into tribes, which constitute so many distinct nations. Each of these tribes appropriates to itself a tract of land forming its domain; in this they do not differ from cultivating nations, except that their territory requires a greater extent, in order to furnish subsistence for their herds throughout the year. Each tribe is collected in one or more camps, which are dispersed through the country, and which make a successive progress over the whole, in proportion as it is exhausted by the cattle; hence it is, that within a great extent a few spots only are inhabited, which vary from one day to another; but as the entire space is necessary for the annual subsistence of the tribe, whoever encroaches on it is deemed a violator of property; this is with them the law of nations. If, therefore, a tribe, or any of its subjects, enter upon a foreign territory, they are treated as enemies and robbers, and a war breaks out. Now, as all the tribes have affinities with each other by alliances of blood or conventions, leagues are formed, which render these wars more or less general. The manner of proceeding on such occasions is very simple. The offence made known, they mount their horses and seek the enemy; when they meet, they enter into a parley, and the matter is frequently made up; if not, they attack either in small bodies, or man to man. They encounter each other at full speed with fixed lances, which they sometimes dart, notwithstanding their length, at the flying enemy: the victory is rarely contested; it is decided by the first shock, and the vanquished take to flight full gallop over the naked plain of the desert. Night generally favours their escape from the conqueror. The tribe which has lost the battle strikes its tents, removes to a distance by forced marches, and seeks an asylum among its allies. The enemy, satisfied with their success, drive their herds farther on, and the fugitives soon after return to their former situation. But the slaughter made in these engagements frequently sows the seeds of hatreds which perpetuate these dissensions. The interest of the common safety has for ages established a law among them, which decrees that the blood of every man who is slain must be avenged by that of his murderer. This vengeance is called *Tar*, or retaliation; and the right of exacting it devolves on the nearest of kin to the deceased. So nice are the Arabs on this point of honour, that if any one neglects to seek his retaliation he is disgraced for ever. He therefore watches every opportunity of revenge: if his enemy perishes from any other cause, still he is not satisfied, and his vengeance is directed against the nearest relation. These animosities are transmitted as an inheritance from father to children, and never cease but by the extinction of one of the families, unless they agree to sacrifice the criminal, or *purchase the blood* for a stated price, in money or in flocks. Without this satisfaction, there is neither peace, nor truce, nor alliances, between them, nor sometimes even between whole tribes: *There is blood between us*, say they on every occasion; and this expression is an

insurmountable barrier. Such accidents being necessarily numerous in a long course of time, the greater part of the tribes have ancient quarrels, and live in an habitual state of war; which, added to their way of life, renders the Bedouins a military people, though they have made no great progress in war as an art.

Their camps are formed in a kind of irregular circle, composed of a single row of tents, with greater or less intervals. These tents, made of goat or camel's hair, are black or brown, in which they differ from those of the Turkmen, which are white. They are stretched on three or four pickets, only five or six feet high, which gives them a very flat appearance; at a distance, one of these camps seems only like a number of black spots; but the piercing eye of the Bedouin is not to be deceived. Each tent inhabited by a family is divided by a curtain into two apartments, one of which is appropriated to the women. The empty space within the large circle serves to fold their cattle every evening. They never have any intrenchments; their only advanced guards and patrols are dogs; their horses remain saddled and ready to mount on the first alarm; but as there is neither order nor regularity, these camps, always easy to surprise, afford no defence in case of an attack: accidents, therefore, very frequently happen, and cattle are carried off every day; a species of marauding war in which the Arabs are very experienced.

The tribes which live in the vicinity of the Turks are still more accustomed to attacks and alarms; for these strangers, arrogating to themselves, in right of conquest, the property of the whole country, treat the Arabs as rebel vassals, or as turbulent and dangerous enemies. On this principle, they never cease to wage secret or open war against them. The pachas study every occasion to harass them. Sometimes they contest with them a territory which they had let them, and at others demand a tribute which they never agreed to pay. Should a family of shaiks be divided by interest or ambition, they alternately succour each party, and conclude by the destruction of both. Frequently too they poison or assassinate those chiefs whose courage or abilities they dread, though they should even be their allies. The Arabs, on their side, regarding the Turks as usurpers and treacherous enemies, watch every opportunity to do them injury. Unfortunately, their vengeance falls oftener on the innocent than the guilty. The harmless peasant generally suffers for the offences of the soldier. On the slightest alarm, the Arabs cut their harvests, carry off their flocks, and intercept their communication and commerce. The peasant calls them thieves, and with reason; but the Bedouins claim the right of war, and perhaps they also are not in the wrong. However this may be, these depredations occasion a misunderstanding between the Bedouins and the inhabitants of the cultivated country, which renders them mutual enemies.

Such is the external situation of the Arabs. It is subject to great vicissitudes, according to the good or bad conduct of their chiefs. Sometimes a feeble tribe raises and aggrandizes itself, whilst another, which was powerful, falls into decay, or perhaps is entirely annihilated; not that all its members perish, but they incorporate themselves with some other; and this is the consequence of the internal constitution of the tribes.

Each

Bedouins.

Bedouins. Each tribe is composed of one or more principal families, the members of which bear the title of shaiks, *i. e.* chiefs or lords. These families have a great resemblance to the patricians of Rome and the nobles of modern Europe. One of the shaiks has the supreme command over the others. He is the general of their little army; and sometimes assumes the title of *emir*, which signifies commander and prince. The more relations, children, and allies, he has, the greater is his strength and power. To these he adds particular adherents, whom he studiously attaches to him, by supplying all their wants. But besides this, a number of small families, who, not being strong enough to live independent, stand in need of protection and alliances, range themselves under the banners of this chief. Such an union is called *kabila*, or tribe. These tribes are distinguished from each other by the name of their respective chiefs, or by that of the ruling family; and when they speak of any of the individuals who compose them, they call them the *children* of such a chief, though they may not be all really of his blood, and he himself may have been long since dead. Thus they say, *Beni Temin*, *Oulad Tai*, the children of Temin and of Tai. This mode of expression is even applied, by metaphor, to the names of countries: the usual phrase for denoting its inhabitants being to call them *the children of such a place*. Thus the Arabs say, *Oulad Masr*, the Egyptians; *Oulad Sham*, the Syrians; they would also say, *Oulad Fransa*, the French; *Oulad Moskou*, the Russians; a remark which is not unimportant to ancient history.

The government of this society is at once republican, aristocratical, and even despotic, without exactly corresponding with any of these forms. It is republican, inasmuch as the people have a great influence in all affairs, and as nothing can be transacted without the consent of a majority. It is aristocratical, because the families of the shaiks possess some of the prerogatives which every where accompany power; and, lastly, it is despotic, because the principal shaik has an indefinite and almost absolute authority, which, when he happens to be a man of credit and influence, he may even abuse; but the state of these tribes confines even this abuse to very narrow limits: for if a chief should commit an act of injustice; if, for example, he should kill an Arab, it would be almost impossible for him to escape punishment; the resentment of the offended party would pay no respect to his dignity; the law of retaliation would be put in force; and, should he not pay the blood, he would be infallibly assassinated, which, from the simple and private life the shaiks lead in their camps, would be no difficult thing to effect. If he harasses his subjects by severity, they abandon him and go over to another tribe. His own relations take advantage of his misconduct to depose him and advance themselves to his station. He can have no resource in foreign troops; his subjects communicate too easily with each other to render it possible for him to divide their interests and form a faction in his favour. Besides, how is he to pay them, since he receives no kind of taxes from the tribe; the wealth of the greater part of his subjects being limited to absolute necessities, and his own confined to very moderate possessions, and those too loaded with great expences?

The principal shaik in every tribe, in fact, defrays

the charges of all who arrive at or leave the camp. He receives the visits of the allies, and of every person who has business with them. Adjoining to his tent is a large pavilion for the reception of all strangers and passengers. There are held frequent assemblies of the shaiks and principal men, to determine on encampments and removals; on peace and war; on the differences with the Turkish governors and the villages; and the litigations and quarrels of individuals. To this crowd, which enters successively, he must give coffee, bread baked on the ashes, rice, and sometimes roasted kid or camel; in a word, he must keep open table; and it is the more important to him to be generous, as this generosity is closely connected with matters of the greatest consequence. On the exercise of this depend his credit and his power. The famished Arab ranks the liberality which feeds him before every virtue: nor is this prejudice without foundation; for experience has proved that covetous chiefs never were men of enlarged views: hence the proverb, as just as it is brief, *A close fist, a narrow heart*. To provide for these expences, the shaik has nothing but his herds, a few spots of cultivated ground, the profits of his plunder, and the tribute he levies on the high-roads; the total of which is very inconsiderable. The shaik with whom M. Volney resided in the country of Gaza, about the end of 1784, passed for one of the most powerful of those districts; yet it did not appear to our author that his expenditure was greater than that of an opulent farmer. His personal effects, consisting in a few pelisses, carpets, arms, horses, and camels, could not be estimated at more than 50,000 livres (a little above L. 2000); and it must be observed, that in this calculation four mares of the breed of racers are valued at 6000 livres (L. 250), and each camel at L. 10 Sterling. We must not therefore, when we speak of the Bedouins, affix to the words *Prince* and *Lord* the ideas they usually convey; we should come nearer the truth by comparing them to substantial farmers in mountainous countries, whose simplicity they resemble in their dress as well as in their domestic life and manners. A shaik who has the command of 500 horse does not disdain to saddle and bridle his own, nor to give him barley and chopped straw. In his tent, his wife makes the coffee, kneads the dough, and superintends the dressing of the victuals. His daughters and kinswomen wash the linen, and go with pitchers on their head and veils over their faces to draw water from the fountain. These manners agree precisely with the descriptions in Homer and the history of Abraham in Genesis. But it must be owned that it is difficult to form a just idea of them without having ourselves been eye-witnesses.

The simplicity, or perhaps more properly the poverty, of the lower class of the Bedouins is proportionate to that of their chiefs. All the wealth of a family consists of moveables; of which the following is a pretty exact inventory; A few male and female camels; some goats and poultry; a mare and her bridle and saddle; a tent; a lance 16 feet long; a crooked sabre; a rusty musket with a flint or matchlock; a pipe; a portable mill; a pot for cooking; a leathern bucket; a small coffee roaster; a mat; some clothes; a mantle of black wool; and a few glass or silver rings, which the women wear upon their legs and arms. If none of these are wanting their furniture is complete.

But:

Bedouins.

Bedouins. But what the poor man stands most in need of, and what he takes most pleasure in, is his mare; for this animal is his principal support. With his mare the Bedouin makes his excursions against hostile tribes, or seeks plunder in the country and on the high-ways. The mare is preferred to the horse, because she is more docile, and yields milk, which on occasion satisfies the thirst and even the hunger of her master.

Thus confined to the most absolute necessities of life, the Arabs have as little industry as their wants are few; all their arts consist in weaving their clumsy tents and in making mats and butter. Their whole commerce only extends to the exchanging camels, kids, stallions, and milk; for arms, clothing, a little rice or corn, and money, which they bury. They are totally ignorant of all science; and have not even any idea of astronomy, geometry, or medicine. They have not a single book; and nothing is so uncommon among the shaiks as to know how to read. All their literature consists in reciting tales and histories in the manner of the Arabian Nights Entertainments. They have a peculiar passion for such stories, and employ in them almost all their leisure, of which they have a great deal. In the evening they seat themselves on the ground, at the threshold of their tents, or under cover, if it be cold; and there, ranged in a circle round a little fire of dung, their pipes in their mouths, and their legs crossed, they sit a while in silent meditation, till on a sudden one of them breaks forth with, *Once upon a time*,—and continues to recite the adventures of some young shaik and female Bedouin: he relates in what manner the youth first got a secret glimpse of his mistress; and how he became desperately enamoured of her: he minutely describes the lovely fair; boasts her black eyes, as large and soft as those of the gazelle; her languid and empassioned looks, her arched eye-brows, resembling two bows of ebony; her waist straight and supple as a lance: he forgets not her steps, light as those of the young filley; nor her eye-lashes, blackened with *kohl*; nor her lips painted blue; nor her nails, tinged with the golden coloured *benna*; nor her breasts resembling two pomegranates; nor her words sweet as honey. He recounts the sufferings of the young lover, *so wasted with desire and passion, that his body no longer yields any shadow*. At length, after detailing his various attempts to see his mistress, the obstacles of the parents, the invasions of the enemy, the captivity of the two lovers, &c. he terminates, to the satisfaction of the audience, by restoring them, united and happy, to the paternal tent, and by receiving the tribute paid to his eloquence, in the *Ma cha allah* (an exclamation of praise, equivalent to *admirably well!*) he has merited. The Bedouins have likewise their love songs, which have more sentiment and nature in them than those of the Turks and inhabitants of the towns; doubtless, because the former, whose manners are chaste, know what love is: while the latter, abandoned to debauchery, are acquainted only with enjoyment.

When we consider how much the condition of the Bedouins, especially in the depths of the desert, resembles in many respects that of the savages of America, we shall be inclined to wonder why they have not the same ferocity; why, though they so often experience the extremity of hunger, the practice of devouring human flesh was never heard of among them; and

why, in short, their manners are so much more sociable and mild. The following reasons are proposed by M. Volney as the true solution of this difficulty.

It seems at first view (he observes), that America, being rich in pasturage, lakes, and forests, is more adapted to the pastoral mode of life than to any other. But if we consider that these forests, by affording an easy refuge to animals, protect them more surely from the power of man, we may conclude that the savage has been induced to become a hunter instead of a shepherd, by the nature of the country. In this state, all his habits have concurred to give him a ferocity of character. The great fatigues of the chase have hardened his body; frequent and extreme hunger, followed by a sudden abundance of game, has rendered him voracious. The habit of shedding blood, and tearing his prey, has familiarized him to the sight of death and sufferings. Tormented by hunger, he has desired flesh; and finding it easy to obtain that of his fellow-creature, he could not long hesitate to kill him to satisfy the cravings of his appetite. The first experiment made, this cruelty degenerates into a habit; he becomes a cannibal, sanguinary and atrocious; and his mind acquires all the insensibility of his body.

The situation of the Arab is very different. Amid his vast naked plains, without water and without forests, he has not been able, for want of game or fish, to become either a hunter or a fisherman. The camel has determined him to a pastoral life, the manners of which have influenced his whole character. Finding at hand a light, but constant and sufficient nourishment, he has acquired the habit of frugality. Content with his milk and his dates, he has not desired flesh: he has shed no blood: his hands are not accustomed to slaughter, nor his ears to the cries of suffering creatures; he has preserved a humane and sensible heart.

No sooner did the savage shepherd become acquainted with the use of the horse, than his manner of life must considerably change. The facility of passing rapidly over extensive tracts of country, rendered him a wanderer. He was greedy from want, and became a robber from greediness; and such is in fact his present character. A plunderer, rather than a warrior, the Arab possesses no sanguinary courage; he attacks only to despoil; and if he meets with resistance, never thinks a small booty is to be put in competition with his life. To irritate him, you must shed his blood; in which case he is found to be as obstinate in his vengeance as he was cautious in avoiding danger.

The Bedouins have often been reproached with this spirit of rapine; but without wishing to defend it, we may observe that one circumstance has not been sufficiently attended to, which is, that it only takes place towards reputed enemies, and is consequently founded on the acknowledged laws of almost all nations. Among themselves they are remarkable for a good faith, a disinterestedness, a generosity, which would do honour to the most civilized people. What is there more noble than that right of asylum so respected among all the tribes? A stranger, nay even an enemy, touches the tent of the Bedouin, and from that instant his person becomes inviolable. It would be reckoned a disgraceful meanness, an indelible shame, to satisfy even a just vengeance at the expence of hospitality. Has the Bedouin consented to eat bread and salt with

his

Bedouins
Bee.

his guest, nothing in the world can induce him to betray him. The power of the Sultan himself would not be able to force a refugee from the protection of a tribe, but by its total extermination. The Bedouin, so rapacious without his camp, has no sooner set his foot within it, than he becomes liberal and generous. What little he possesses he is ever ready to divide. He has even the delicacy not to wait till it is asked: when he takes his repast, he affects to seat himself at the door of his tent, in order to invite the passengers; his generosity is so sincere, that he does not look upon it as a merit, but merely as a duty; and he therefore readily takes the same liberty with others. To observe the manner in which the Arabs conduct themselves towards each other, one would imagine that they possessed all their goods in common. Nevertheless they are no strangers to property; but it has none of that selfishness which the increase of the imaginary wants of luxury has given it among polished nations. Deprived of a multitude of enjoyments which nature has lavished upon other countries, they are less exposed to temptations which might corrupt and debase them. It is more difficult for their Shaiks to form a faction to enslave and impoverish the body of the nation. Each individual, capable of supplying all his wants, is better able to preserve his character and independence; and private poverty becomes at once the foundation and bulwark of public liberty.

This liberty extends even to matters of religion. We observe a remarkable difference between the Arabs of the towns and those of the desert; since, while the former crouch under the double yoke of political and religious despotism, the latter live in a state of perfect freedom from both: it is true, that on the frontiers of the Turks, the Bedouins, from policy, preserve the appearance of Mahometanism; but so relaxed is their observance of its ceremonies, and so little fervour has their devotion, that they are generally considered as infidels, who have neither law nor prophets. They even make no difficulty in saying that the religion of Mahomet was not made for them: "For (add they) how shall we make ablutions who have no water? How can we bestow alms who are not rich? Why should we fast in the Ramadan, since the whole year with us is one continual fast? and what necessity is there for us to make the pilgrimage to Mecca, if God be present every where?" In short, every man acts and thinks as he pleases, and the most perfect toleration is established among them.

BEDRIACUM, (anc. geog.), a village of Italy, situated, according to Tacitus, between Verona and Cremona, but nearer the latter than the former. From the account given by that historian, Cluverius conjectures that the ancient Bedriacum stood in the place where the city of Caneto now stands. This village was remarkable for the defeat of the emperor Galba by Otho, and afterwards of Otho by Vitellius.

BEDWIN-MAGNA, a village five miles south of Hungerford in Berkshire in England. It has neither market nor fair; but is a borough by prescription, and sends two members to parliament. It is said to have been a considerable place in the time of the Saxons, and that the traces of its fortifications are still extant.

BEE, in natural history, a genus of insects, the characters of which are given under the Latin or Lin.
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nean name *Apis*. The principal species are there also described; excepting the mellifica, or domestic honey-bee, the history and management of which was referred to this article.

This species is furnished with downy hairs; has a dusky coloured breast, and brownish belly; the tibiae of the hind legs are ciliated, and transversely streaked on the inside. Each foot terminates in two hooks, with their points opposite to each other; in the middle of these hooks there is a little thin appendix, which, when unfolded, enables the insects to fasten themselves to glass or the most polished bodies. This part they likewise employ for transmitting the small particles of crude wax which they find upon flowers to the cavity in their thigh, hereafter described. The queen and drones, who never collect wax in this manner, have no such cavity. This species is also furnished with a proboscis or trunk, which serves to extract the honey from flowers; and has, besides, a real mouth situated in the forepart of the head, with which it is able to feed on the farina of flowers, from which afterwards is made wax. The belly is divided into six rings or joints; which sometimes shorten the body, by slipping the one over the other. In the inside of the belly there is a small bladder or reservoir, in which the honey is collected, after having passed through the proboscis and a narrow pipe which runs through the head and breast. This bladder, when full of honey, is about the size of a small pea.

The sting, which is situated at the extremity of the belly, is a very curious weapon; and, when examined by the microscope, appears of a surprising structure. It has a horny sheath or scabbard, which includes two bearded darts. This sheath ends in a sharp point, near the extremity of which a slit opens, through which, at the time of stinging, the two bearded darts are protruded beyond the end of the sheath: one of these is a little longer than the other, and fixes its beard first; and the other instantly following, they penetrate alternately deeper and deeper, taking hold of the flesh with their beards or hooks, till the whole sting is buried in the flesh; and then a venomous juice is injected through the same sheath, from a little bag at the root of the sting. Hence the wound occasions an acute pain and swelling of the part, which sometimes continues several days. These effects are best remedied by enlarging the wound directly, to give it some discharge. This poison seems to owe its mischievous efficacy to certain pungent salts. Let a bee be provoked to strike its sting against a plate of glass, and there will be a drop of the poison discharged and left upon the glass. This being placed under a double microscope, as the liquor evaporates, the salts will be seen to concrete, forming oblong, pointed, clear crystals.—Mr Derham counted on the sting of a wasp eight beards on the side of each dart, somewhat like the beards of fish-hooks; and the same number is to be counted on the darts of the bee's sting. When these beards are struck deep in the flesh, if the wounded person starts, or discomposes the bee before it can disengage them, the sting is left behind sticking in the wound: but if he have patience to stand quiet, the creature brings the hooks down close to the sides of the darts, and withdraws the weapon; in which case, the wound is always much less painful. The danger of being stung by bees may be in a great measure

Bee.

Description
of the honey-bee.

Its sting.

Bee.

measure prevented by a quiet composed behaviour. A thousand bees will fly and buzz about a person without hurting him, if he stand perfectly still, and forbear disturbing them even when near his face; in which case he may observe them for hours together without danger; but if he molests or beats them away, he usually suffers for it. It has been lately affirmed*, that a person is in perfect safety in the midst of myriads of bees, if he but carefully keep his mouth shut, and breathe gently through the nostrils only; the human breath, it would seem, being peculiarly offensive to their delicate organs: and merely with this precaution, it is said, the very hives may be turned up, and even part of the comb cut out, while the bees are at work.

* See Edinburgh Medical Commentaries, Vol. IV. p. 352.

I. OECONOMY, INSTINCTS, &c. of the HONEY-BEE.

We may consider a hive of bees as a well-peopled city, in which are commonly found from 15,000 to 18,000 inhabitants. This city is in itself a monarchy;—composed of a *queen*; of males, which are the *drones*; and of *working bees*, which have been supposed and called neuters. The combs, which are of pure wax, serve as their magazine of stores, and for the nursing places of their young offspring. There is between the combs a space sufficient for two bees to march abreast, without embarrassing each other; and in some parts it is more spacious. There are also holes, or narrow passages, which cross the combs transversely, and are intended to shorten the way when the bees pass from one comb to another.

3 Queen bee.

The *QUEEN* is easily distinguished from the other bees by the form of her body: she is longer and larger than they are, and her wings are much shorter than theirs in proportion to her body; for the wings of the other bees cover their whole body, whereas those of the queen hardly reach beyond her middle, or end at about the third ring of her belly. Her hinder parts are more taper than those of the other bees, terminating sharper. Her belly and legs are of a deep yellow, much resembling the purest gold. She is unwieldy in her flight, a reason for her seldom flying but when she leaves the parent-hive to go and settle a colony. All the bees form her retinue, and like dutiful subjects repair to the place she chooses. She is armed with a vigorous sting. Less passionate however than her subjects, she only uses her sting when long provoked, or when in contest for imperial sway. Never more than one remains in a hive, and that is the conqueror.

4 Attachment of her subjects.

A hive of bees cannot subsist without a queen, as she alone produces their numerous posterity; and on this account their fidelity and attachment to their sovereign is admirable.

5 Mr Wildman's feats by means of the queen.

Mr Wildman, by his dexterity in the management of bees, some years ago, surprised the whole kingdom. He can cause a swarm to light where he pleases, almost instantaneously; he can order them to settle on his head, then remove them to his hand; command them to depart and settle on a window, table, &c. at pleasure. We shall subjoin his method of performing these feats in his own words:

“Long experience has taught me, that as soon as I turn up a hive, and give it some taps on the sides and bottom, the queen immediately appears, to know the cause of this alarm; but soon retires again among her people. Being accustomed to see her so often, I readily perceive her at first glance; and long practice has en-

abled me to seize her instantly, with a tenderness that does not in the least endanger her person. This is of the utmost importance; for the least injury done to her brings immediate destruction to the hive, if you have not a spare queen to put in her place, as I have too often experienced in my first attempts. When possessed of her, I can without injury to her, or exciting that degree of resentment that may tempt her to sting me, slip her into my other hand, and, returning the hive to its place, hold her there, till the bees missing her, are all on wing, and in the utmost confusion. When the bees are thus distressed, I place the queen wherever I would have the bees to settle. The moment a few of them discover her, they give notice to those near them, and those to the rest; the knowledge of which soon becomes so general, that in a few minutes they all collect themselves round her; and are so happy in having recovered this sole support of their state, that they will long remain quiet in their situation. Nay, the scent of her body is so attractive of them, that the slightest touch of her, along any place or substance, will attach the bees to it, and induce them to pursue any path she takes.” This was the only witchcraft used by Mr Wildman, and is that alone which is practised by others who have since made similar exhibitions. In short, seize on the queen, and you are sure of leading all the bees of a hive to any place you please.

When a queen dies by an accident, the bees of her hive immediately cease working, consume their own honey, fly about their own and other hives at unusual hours when other bees are at rest, and pine away if not soon supplied with another sovereign. Her loss is proclaimed by a clear and interrupted humming. This sign should be a warning to the owner of the bees, to take what honey remains in the hive, or to procure them another queen. In this last case, the flock instantly revives; pleasure and activity are apparent thro’ the whole hive; the presence of the sovereign restores vigour and exertion, and her voice commands universal respect and obedience: of such importance is the queen to the existence and prosperity of the other members of this community.

6 Consequences of her death, &c.

The dissection of the queen-bee shows evidently that she lays many thousand eggs. It is computed that the ovaria of a queen-bee contain more than 5000 eggs at one time; and therefore it is not difficult to conceive that a queen-bee may produce 10,000 or 12,000 bees, or even more, in the space of two months.

The common *DRONES* are smaller than the queen, and larger than the working bees; and in flying they make a greater noise. The dissection of the drone gives as great proof of its being the male, as that of the queen does of her being female. In this creature there is no appearance of ovaries or eggs, nor any thing of the structure of the common working bees, but the whole abdomen is filled with transparent vessels, winding about in various sinuosities, and containing a white or milky fluid. This is plainly analogous to that fluid in the males of other animals, which is destined to render the eggs of the female prolific; and this whole apparatus of vessels, which much resembles the turnings and windings of the seminal vessels in other animals, is plainly intended only for the preparation and retention of this matter, till the destined time of its being emitted. On squeezing the hinder parts, also, may be forced out the penis, a small and slender fleshy body, contained be-

7 Of the drones.

tween

^{Bee.} tween two horns of a somewhat harder substance, which join at their base, but gradually part asunder as they are continued in length. These parts, found in all the drones, and none of them in any other bees except these, seem to prove very evidently the difference of sex. If a hive is opened in the beginning of spring, not a single drone will be found in it; from the middle of May till the end of June, hundreds of them will be found, commonly from 200 or 300 to 1000; and from thence to the following spring it would be in vain to seek for them. They go not out till 11 in the morning, and return before six in the evening. But their expeditions are not those of industry. They have no sting, their rostrum and feet are not adapted for collecting wax and honey, nor indeed are they obliged to labour. They only hover upon flowers to extract the sweets, and all their thoughts are pleasure. Their office is, to impregnate the eggs of the queen after they are deposited in the cells. And while their presence is thus necessary, they are suffered to enjoy the sweets of love and life; but as soon as they become useless in the hive, the working bees declare the most cruel war against them, and make terrible slaughter of them. This war affects not only the bees already in life, but even the eggs and maggots; for the law which has pronounced the destruction of the males has no exception, it extends equally to those which do not yet breathe and to those which do; the hive is cleared of every egg, maggot, or nymph; the whole is torn away and carried off. After the season proper for increasing the number of bees is past, and when they should attend only to the supplying of their magazines sufficiently with winter stores, every vestige of the drones is destroyed, to make room for honey. Whenever these drones are observed to remain in a hive late in the autumn, it is held to be a bad sign of the state of the hive.

But besides these larger drones, Maraldi and Reaumur had long ago discovered that there were others of a lesser size, not exceeding that of the common working bees. This fact, however, was not fully ascertained before the late experiments of Mr DeBraw, to be afterwards mentioned. It is well known, as has been already noticed, that the large drones never appear in the hive before the middle of April; that they are all dead before the end of August, when the principal breeding season terminates; and that they are destroyed, together with all their worms or nymphs, by the working bees, probably by order of the queen, to save honey: yet it is equally certain, that the bees begin to breed early in the spring, sometimes in February, if the weather is mild; and that many broods are completed before these drones appear. But if drones of a smaller size are suffered to remain, which in a time of scarcity consume less honey than the others, these will answer the purpose of supplying the early broods, and the larger drones are produced against a time of greater plenty. Some observers affirm, that the smaller drones are all dead before the end of May, when the larger species appear and supersede their use. These circumstances accord with the suggestion of Abbe Le Pluche in his *Speclacle de la Nature*, That a small number of drones are reserved to supply the necessities of the ensuing year; and that these drones are very little, if at all, larger than the common bees.

The WORKING BEES compose the greatest body of the state. Columella informs us, that the ancients distinguished several kinds of them. He joins in opinion with Virgil, who approves of those which are small, oblong, smooth, bright, and shining, of a gentle and mild disposition: "for," continues he, "by how much the larger and rounder the bee is, by so much the worse it is; but if it be fierce and cruel, it is the worst of all. The angry disposition of bees of a better character is easily softened by the frequent intercourse of those who take care of them, for they grow more tame when they are often handled." The experience of ages has now established the sort of bees which have been found to answer best the purposes of keeping them.

The working bees have the care of the hive, collect the wax and honey, fabricate and work up the wax, build the cells, feed the young, keep the hive clean, drive from thence strangers, and employ themselves in all other concerns relating to the hive.

The working bee has two stomachs; one which contains the honey, and a second in which is contained the crude wax. The working bees have no parts analogous to the ovaria of the queen, or that resemble the male organs of the drones. Hence they have generally been supposed to be neutral or of neither sex. But a different doctrine has lately been established; which there will be occasion to notice in the sequel.

The sting is very necessary for a working bee, both as an offensive and as a defensive weapon: for their honey and wax excite the envy of many greedy and lazy insects; and they have also to defend themselves against enemies, who are fonder of eating them than their honey. There is likewise a time when the drones must be sacrificed and exterminated for the good of the society; and as they are larger and stronger than the working bees, these last would have a very unequal match, were it not for this poisonous sting.

There happen also among bees, either of the same ⁹ Of their or of different hives, most deadly feuds, in which their battles. stings are their chief weapons. In these contests, great skill may be discerned in their manner of pointing the sting between the scaly rings which cover their bodies, or to some other easily vulnerable part. The bee which first gains the advantage remains the conqueror: tho' the victory costs the victor his life, if he has left his sting in the body of the enemy; for, with the sting, so much of his body is torn out, that death inevitably follows. Bees have very severe conflicts when whole hives engage in a pitched battle, and many are slain on both sides. Their fighting and plundering one another ought chiefly to be imputed, as Mr Thorley observes, either to their perfect abhorrence of sloth and idleness, or to their insatiable thirst for honey; for when, in spring or autumn, the weather is fair, but no honey can be collected from plants, and is to be found only in the hives of other bees, they will venture their lives to get it there.

Dr Warder assigns another cause of their fighting; which is, the necessity that the bees are reduced to when their own hive has been plundered, at a season when it is too late for them to repair the loss by any industry in the fields.

Sometimes one of the queens is killed in battle. In this case, the bees of both hives unite as soon as her death

Bee.

death is generally known among them. All then become one people; the vanquished go off with the robbers, richly laden with their own spoils, and return every day with their new associates to pillage their old habitation. This causes a throng, unusual for the season, at the door of the hive they are plundering; and if the owner lifts it up at night, when all are gone home, he will find it empty of inhabitants; though there perhaps will remain in it some honey, which he takes as his property.

When two swarms take flight at the same time, they sometimes quarrel, and great numbers are destroyed on both sides, till one of the queens is slain. This ends the contest, and the bees of both sides unite under the surviving sovereign.

10
Their la-
bours.

When the bees begin to work in their hives, they divide themselves into four companies: one of which roves in the fields in search of materials; another employs itself in laying out the bottom and partitions of their cells; a third is employed in making the inside smooth from the corners and angles; and the fourth company brings food for the rest, or relieves those who return with their respective burdens. But they are not kept constant to one employment; they often change the tasks assigned them: those that have been at work, being permitted to go abroad; and those that have been in the fields already, take their places. They seem even to have signs, by which they understand each other: for when any of them want food, it bends down its trunk to the bee from whom it is expected, which then opens its honey-bag, and lets some drops fall into the other's mouth, which is at that time opened to receive it. Their diligence and labour is so great, that, in a day's time, they are able to make cells which lie upon each other numerous enough to contain 3000 bees.

11
Of the
combs.

In the plan and formation of these cells they discover a most wonderful sagacity. In constructing habitations within a limited compass, an architect would have three objects in view: first, to use the smallest quantity that can be of materials; next, to give to the edifice the greatest capacity in a determined space; and thirdly, to employ the spot in such a manner that none of it may be lost. On examination, it will be found that the bees have obtained all these advantages in the hexagonal form of their cells: for, first, there is an economy of wax, as the circumference of one cell makes part of the circumferences of those contiguous to it; secondly, the economy of the spot, as those cells which join to one another leave no void between them; and thirdly, the greatest capacity or space; as, of all the figures which can be contiguous, that with six sides gives the largest area. This thriftiness prompts them to make the partitions of their cells thin; yet they are constructed so as that the solidity may compensate for the scantiness of materials. The parts most liable to injury are the entrance of the cells. These the bees take care to strengthen, by adding quite round the circumference of the apertures a fillet of wax, by which means this mouth is three or four times thicker than the sides: and they are strengthened at the bottom by the angle formed by the bottom of three cells falling in the middle of an opposite cell. The combs lie parallel to each other; and there is left between every

Bee.

one of them a space which serves as a street, broad enough for two bees to pass by each other. There are holes which go quite through the combs, and serve as lanes for the bees to pass from one comb to another, without being obliged to go a great way about. When they begin their combs, they form at the top of the hive a root or stay to the whole edifice, which is to hang from it. Though they generally lay the foundations of the combs so that there shall be no more between them than what is sufficient for two bees to pass, yet they sometimes place those beginnings of two combs too far asunder; and, in this case, in order to fill up part of the void space arising from that bad disposition, they carry their combs on obliquely, to make them gradually approach each other. This void space is sometimes so considerable, that the bees build in it an intermediate comb, which they terminate as soon as the original combs have only their due distances. As the combs would be apt, when full, to overcome by their weight all the security which the bees can give them against falling; they who prepare hives, set in them, crosswise, sticks, which serve as props to the combs, and save the bees a great deal of labour. It is not easy to discover the particular manner of their working; for, notwithstanding the many contrivances used for this purpose, there are such numbers in continual motion, and succeed one another with such rapidity, that nothing but confusion appears to the sight. Some of them, however, have been observed carrying pieces of wax in their talons, and running to the places where they are at work upon the combs. These they fasten to the work by means of the same talons. Each bee is employed but a very short time in this way: but there is so great a number of them that go on in a constant succession, that the comb increases very perceptibly. Besides these, there are others that run about beating the work with their wings and the hinder part of their body, probably with a view to make it more firm and solid.

Whilst part of the bees are occupied in forming the cells, others are employed in perfecting and polishing those that are new modelled. This operation is performed by their talons, taking off every thing that is rough and uneven. These polishers are not so desultory in their operations as those that make the cells; they work long and diligently, never intermitting their labour, excepting to carry out of the cell the particles of wax which they take off in polishing. These particles are not allowed to be lost; others are ready to receive them from the polishers, and to employ them in some other part of the work.

The balls which we see attached to the legs of bees returning to the hives are not wax, but a powder collected from the stamina of flowers, and yet brought to the state of wax. The substance of these balls, heated in any vessel, does not melt as wax would do, but becomes dry, and hardens: it may even be reduced to a coal. If thrown into water, it will sink; whereas wax swims. To reduce this crude substance into wax, it must first be digested in the body of the bee.

Every bee, when it leaves the hive to collect this precious store, enters into the cup of the flower, particularly such as seem charged with the greatest quantities of this yellow farina. As the animal's body is covered

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Of their
building-
materials,
and provi-
sions.
1. Wax.

Bee.

covered over with hair, it rolls itself within the flower, and quickly becomes quite covered with the dust, which it soon after brushes off with its two hind legs, and kneads into two little balls. In the thighs of the hind-legs there are two cavities, edged with hair; and into these, as into a basket, the animal sticks its pellets. Thus employed, the bee flits from flower to flower, increasing its store, and adding to its stock of wax, until the ball upon each thigh becomes as big as a grain of pepper; by this time having got a sufficient load, it returns, making the best of its way to the hive.

After the bees have brought home this crude substance, they eat it by degrees; or at other times, three or four bees come and ease the loaded bee, by eating each of them a share, the loaded bee giving them a hint so to do. Hunger is not the motive of their thus eating the balls of waxy matter, especially when a swarm is first hived; but it is their desire to provide a speedy supply of real wax for making the combs. At other times, when there is no immediate want of wax, the bees lay this matter up in repositories, to keep it in store.

When this waxy matter is swallowed, it is, by the digestive powers of the bee, converted into real wax, which the bees again disgorge as they work it up into combs; for it is only while thus soft and pliant from the stomach that they can fabricate it properly. That the wax thus employed is taken from their stomachs, appears from their making a considerable quantity of comb soon after they are hived, and even on any tree or shrub where they have rested but a short while before their being hived, though no balls were visible on their legs, excepting those of a few which may be just returned from the field. This is farther confirmed by what happened in a swarm newly hived: for two days together from the time of their quitting their former home it rained constantly, insomuch that not one bee was able to stir out during that time; yet at the end of the two days they had made a comb 15 or 16 inches long, and thick in proportion.

The crude wax, when brought home by the bees, is often of as different colours as are the flowers from which it is collected: but the new combs are always of a white colour, which is afterwards changed only by the impurities arising from the steam, &c. of the bees.

Bees collect crude wax also for food; for if this was not the case, there would be no want of wax after the combs are made: but they are observed, even in old hives, to return in great numbers loaded with such matter, which is deposited in particular cells, and is known by the name of *bee-bread*. We may guess that they consume a great deal of this substance in food by the quantity collected; which, by computation, may in some hives, amount to an hundred weight in a season, whilst the real wax in such an hive does not perhaps exceed two pounds.

¹³
2 The pro-
polis.

It is well known that the habitation of bees ought to be very close; and what their hives want from the negligence or unskilfulness of man, these animals supply by their own industry: so that it is their principal care, when first hived, to stop up all the crannies. For this purpose they make use of a resinous gum, which is more tenacious than wax, and differs greatly from it. This the ancients called *propolis*. It will grow consider-

Bee.

ably hard in the hive, though it will in some measure soften by heat; and is often found different in consistence, colour, and smell. It has generally an agreeable aromatic odour when it is warmed; and by some it is considered as a most grateful perfume. When the bees begin to work with it, it is soft; but it acquires a firmer consistence every day, till at length it assumes a brown colour, and becomes much harder than wax. The bees carry it on their hinder legs; and some think it is met with on the birch, the willow, and poplar. However it is procured, it is certain that they plaster the inside of their hives with this composition.

Honey is originally a juice digested in plants, which sweats through their pores, and chiefly in their flowers, or is contained in reservoirs in which nature stores it. The bees sometimes penetrate into these stores, and at other times find the liquor exsuded. This they collect in their stomachs; so that, when loaded with it, they seem, to an inattentive eye, to come home without any booty at all.

¹⁴
3. The bee-
ney.

Besides the liquor already mentioned, which is obtained from the flowers of plants, another substance, called *honey-dew**, has been discovered, of which the bees are equally fond. Of this substance there are two kinds, both deriving their origin from vegetables, though in very different ways. ^{See the article Honey-dew.}

The first kind, the only one known to husbandmen, and which passes for a dew that falls on trees, is no other than a mild sweet juice, which having circulated through the vessels of vegetables, is separated in proper reservoirs in the flowers, or on the leaves, where it is properly called the *honey-dew*: sometimes it is deposited in the pith, as in the sugar-cane; and, at other times, in the juice of pulpy summer-fruits when ripe. Such is the origin of the manna which is collected on the ash and maple of Calabria and Briançon, where it flows in great plenty from the leaves and trunks of these trees, and thickens into the form in which it is usually seen.

The second kind of honey-dew, which is the chief resource of bees after the spring-flowers and dew by transpiration on leaves are past, owes its origin to a small mean insect†, the excrement thrown out by which makes a part of the most delicate honey we ever taste. ^{See the articles Aphis and Honey-dew.}

From whatever source the bees have collected their honey, the instant they return home, they seek cells in which they may disgorge and deposit their loads. They have two sort of stores: one which consists of honey laid up for the winter; and the other of honey intended for accidental use in case of bad weather, and for such bees as do not go abroad in search of it. Their method of securing each of these is different. They have in each cell a thicker substance, which is placed over the honey, to prevent its running out of the cell; and that substance is raised gradually as the cell is filled, till the bees, finding that the cell cannot contain any more, close it with a covering of wax, not to be opened till times of want, or during the winter.

It has been already observed, that the cells are intended for other purposes besides being places of store for honey. One of the chief uses is, their being nurseries for the young. The cells for those which are to be working bees, are commonly half an inch deep; those for drones, three quarters of an inch; and those which are intended for keeping of honey only, still deeper. ¹⁵
Of the manner in which bees breed.

Bee.

deeper. This accounts for the inequalities observed in the surface of combs.

The queen-bee is generally concealed in the most secret part of the hive, and is never visible but when she lays her eggs in such combs as are exposed to light. When she does appear, she is always attended by ten or a dozen of the common sort, who form a kind of retinue, and follow her wherever she goes with a sedate and grave tread. Before she lays her eggs, she examines the cells where she designs to lay them; and if she finds that they contain neither honey, wax, nor any embryo, she introduces the posterior part of her body into a cell, and fixes to the bottom of it a small white egg, which is composed of a thin white membrane, full of a whitish liquor. In this manner she goes on, till she fills as many cells as she has eggs to lay, which are generally many thousands. Sometimes more than one egg has been deposited in the same cell; when this is the case, the working bees remove the supernumerary eggs, and leave only one in each cell. On the first or second day after the egg is lodged in the cell, the drone bee injects a small quantity of whitish liquid, which in about a day is absorbed by the egg. On the third or fourth day is produced a worm or maggot; which, when it is grown so as to touch the opposite angle, coils itself up in the shape of a semicircle, and floats in a proper liquid, whereby it is nourished and enlarged in its dimensions. This liquor is of a whitish colour, of the thickness of cream, and of an insipid taste like flour and water. Naturalists are not agreed as to the origin and qualities of this liquid. Some have supposed, that it consists of some generative matter, injected by the working bees into each cell, in order to give fecundity to the egg: but the most probable opinion is, that it is the same with what some writers have called the *bee-bread*; and that it is a mixture of water with the juices of plants and flowers collected merely for the nutrition of the young, whilst they are in their weak and helpless state. Whatever be the nature of this aliment, it is certain that the common working bees are very industrious in supplying the worms with a sufficient quantity of it. The worm is fed by the working bees for about eight days, till one end touches the other in the form of a ring; and when it begins to feel itself uneasy in its first posture, it ceases to eat, and begins to unroll itself, thrusting that end forward towards the mouth of the cell which is to be the head. The attendant bees, observing these symptoms of approaching transformation, desist from their labours in carrying proper food, and employ themselves in fastening up the top of the cell with a lid of wax, formed in concentric circles, and by their natural heat in cherishing the brood and hastening the birth. In this concealed state the worm extends itself at full length, and prepares a web of a sort of silk, in the manner of the silk-worm. This web forms a complete lining for the cell, and affords a convenient receptacle for the transformation of the worm into a nymph or chrysalis. Some naturalists suppose, that as each cell is destined to the successive breeding of several worms, the whole web, which is composed of many crusts or doubles, is in reality a collection of as many webs as there have been worms. M. Maraldi apprehends, that this lining is formed of the skin of the worm thrown off at its entrance into the nymph state:

but it is urged, that if the cells are opened when newly covered by the bees, the worm within will be found in its own form, and detected in the art of spinning its web; and by means of glasses it will be found composed of fine threads regularly woven together, like those of other spinning animals. In the space of 18 or 20 days the whole process of transformation is finished, and the bee endeavours to discharge itself from confinement by forcing an aperture with its teeth through the covering of the cell. The passage is gradually dilated; so that one horn first appears, then the head, and afterwards the whole body. This is usually the work of three hours, and sometimes of half a day. The bee, after it has disengaged itself, stands on the surface of the comb, till it has acquired its natural complexion, and full maturity and strength, so as to become fit for labour. The rest of the bees gather round it in this state, congratulate its birth, and offer it honey out of their own mouths. The exuviae and scattered pieces of wax which are left in the cell are removed by the working bees; and the matrix is no sooner cleansed and fit for new fecundation, but the queen deposits another egg in it; inasmuch that, Mr Maraldi says, he has seen five bees produced in the same cell in the space of three months. The young bees are easily distinguished from the others by their colour; they are grey, instead of the yellowish brown of the common bees. The reason of this is, that their body is black, and the hairs that grow upon it are white, from the mixture of which seen together results a grey; but this colour forms itself into a brownish yellow by degrees, the rings of the body becoming more brown and the hairs more yellow.

The eggs from which drones are to proceed, are, as already observed, laid in larger cells than those of the working bees. The coverings of these cells, when the drones are in the nymph state, are convex or swelling outward, whilst the cells of the working bees are flat. This, with the privilege of leading idle effeminate lives, and not working for the public stock, is what distinguishes the drones,

The bees depart from their usual style of building when they are to raise cells for bringing up such maggots as are destined to become queens. These are of a longish oblong form, having one end bigger than the other, with their exterior surface full of little cavities. Wax, which is employed with so geometrical a thriftiness in the raising of hexagonal cells, is expended with profusion in the cell which is to be the cradle of a royal maggot. They sometimes fix it in the middle, and at other times on one side of a comb. Several common cells are sacrificed to serve as a basis and support to it. It is placed almost perpendicular to the common cells, the largest end being uppermost. The lower end is open till the season for closing it comes, or till the maggot is ready for transformation. It would be difficult to conceive how a tender maggot can remain in a cell turned bottom upmost, if we did not find it buried in a substance scarcely fluid, and if it was not in itself, at first, small and light enough to be suspended in this clammy paste. As it grows it fills all the upper and larger part of the cell. As soon as the young queen comes out of her cell, that cell is destroyed, and its place is supplied by common cells; but as the foundation of the royal cell is left, this part of the comb is found

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Bee.

found thicker than any other. There are several such cells prepared: for if there was only one reared in each hive, the swarms might often want a conductress. Many accidents may also destroy the little maggot before it becomes a bee. It is therefore necessary that a number of such cells should be provided; and accordingly there are observed several young queens in the beginning of the summer, more than one of which often takes flight when a swarm departs.

A young queen is in a condition to lead a swarm from a hive in which she was born in four or five days after she has appeared in it with wings. The bees of a swarm are in a great hurry when they know that their queen is ready to lay. In this case, they give to their new cells but part of the depth they are to have, and defer the finishing of them till they have traced the number of cells requisite for the present time. The cells first made are intended only for working bees; these being the most necessary.

16
Of their
swarming.

When the hive is become too much crowded by the addition of the young brood, a part of the bees think of finding themselves a more commodious habitation, and with that view single out the most forward of the young queens. A new swarm is therefore constantly composed of one queen at least, and of several thousand working bees, as well as of some hundreds of drones. The working bees are some old, some young.

Scarce has the colony arrived at its new habitation, when the working bees labour with the utmost diligence to procure materials for food and building. Their principal aim is not only to have cells in which they may deposit their honey: a stronger motive seems to animate them. They seem to know that their queen is in haste to lay her eggs. Their industry is such, that in 24 hours they will have made combs 20 inches long, and wide in proportion. They make more wax during the first fortnight, if the season is favourable, than they do during all the rest of the year. Other bees are at the same time busy in stopping all the holes and crevices they find in their new hive, in order to guard against the entrance of insects which covet their honey, their wax, or themselves; and also to exclude the cold air, for it is indispensably necessary that they be lodged warm.

When the bees first settle in swarming, indeed when they at any time rest themselves, there is something very particular in their method of taking their repose. It is done by collecting themselves in a heap, and hanging to each other by their feet. They sometimes extend these heaps to a considerable length. It would seem probable to us, that the bees from which the others hang must have a considerable weight suspended to them. All that can be said is, that the bees must find this to be a situation agreeable to themselves. They may perhaps have a method of distending themselves with air, thereby to lessen their specific gravity; in the same manner as fishes do, in order to alter their gravity compared with water.

When a swarm divides into two or more bands, which settle separately, this division is a sure sign that there are two or more queens among them. One of these clusters is generally larger than the other. The bees of the smaller cluster, or clusters, detach themselves by little and little, till at last the whole, together with the queen or queens, unite with the largest cluster.

As soon as the bees are settled, the supernumerary queen, or queens, must be sacrificed to the peace and tranquillity of the hive. This execution generally raises a considerable commotion in the hive; and several other bees, as well as the queen or queens, lose their lives. Their bodies may be observed on the ground, near the hive. The queen that is chosen is of a more redish colour than those which are destroyed: so that fruitfulness seems to be a great motive of preference in bees; for the nearer they are to the time of laying their eggs, the bigger, larger, and more shining are their bodies. The method of hiving these swarms will be explained hereafter.

Besides the capital instincts above mentioned, bees are possessed of others, some of which are equally necessary for their preservation and happiness.—They anxiously provide against the entrance of insects into the hive, by gluing up with wax the smallest holes in the skep. Some stand as centinels at the mouth of the hive, to prevent insects of any kind from getting in. But if a snail, or other large insect should get in, notwithstanding all resistance they sting it to death; and then cover it over with a coat of propolis, to prevent the bad smell or maggots which might proceed from the putrefaction of such a large animal.—Bees seem to be warned of the appearance of bad weather by some particular feeling. It sometimes happens, even when they are very assiduous and busy, that they on a sudden cease from their work; not a single one stirs out; and those that are abroad hurry home in such prodigious crowds, that the doors of their habitations are too small to admit them. On this occasion, look up to the sky, and you will soon discover some of those black clouds which denote impending rain. Whether they see the clouds gathering for it, as some imagine, or whether (as is much more probable) they feel some other effects of it upon their bodies, is not yet determined; but it is alleged, that no bee is ever caught even in what we call a sudden shower, unless it have been at a very great distance from the hive, or have been before injured by some accident, or be sickly and unable to fly so fast as the rest.—Cold is a great enemy to them. To defend themselves against its effects during a hard winter, they crowd together in the middle of the hive, and buzz about, and thereby excite a warmth which is often perceptible by laying the hand upon the glass-windows of the hive.—They seem to understand one another by the motions of their wings: When the queen wants to quit the hive, she gives a little buzz; and all the others immediately follow her example, and retire along with her.

As to the age of bees, the large drones live but a little while, being destroyed without mercy by the working bees, probably to save honey, as already noticed. But of the other sort lately discovered, no larger than the working bees, and not easily to be distinguished from them, the age has not yet been ascertained. Writers are not agreed as to the age of the working bees. Some maintain that they are annual, and others suppose that they live many years. Many of them, it is well known, die annually of hard labour; and though they may be preserved by succession in hives or colonies for several years, the most accurate observers are of opinion that their age is but a year, or at the longest no more than two summers.

Bee.

17
Other in-
stincts.

18

Age of bees.

Con-

Bee.
19
Opinions
concerning
the sex and
fecundation
of bees.

Concerning the sex and fecundation of bees, various experiments have been made of late years, by which new light has been thrown upon the subject, and several difficulties which embarrassed the process of generation among these curious insects seem to have been removed.

* Barbut.
Genera. of
Insects, p.
268.

Swammerdam, and after him Maraldi, discovered in the structure of the drones some resemblance to the male organs of generation, as has already been described; and from thence concluded that they were the males: but neither of those accurate and industrious observers could detect them in the act of copulation. Swammerdam, therefore, entertained a notion, that the female or queen-bee was fecundated without copulation; that it was sufficient for her to be near the males; and that her eggs were impregnated by a kind of vivifying aura, exhaled from the body of the males, and absorbed by the female. However, M. Reaumur thought that he had discovered the actual copulation of the drones with the female bee, and he has very minutely described the process of it. A very ingenious naturalist* of the present day, without taking any notice of recent discoveries, seems to have given into the same idea. "The office of the males or drones (says he) is to render the queen pregnant. One single female should in the midst of seven or eight hundred males, one would think, be incessantly assailed. But nature has provided against that inconvenience, by making them of a constitution extremely frigid. The female chooses out one that pleases her; she is obliged to make the first advances, and excite him to love by her caresses. But this favour proves fatal to him: scarce has he ceased from amorous dalliance, but he is seen to perish. The pleasure of these observations may be taken, by putting a female with several males into a bottle."

Others again, as M. Schirach and M. Hattorff, reject the drones as bearing no share at all in the business of propagation, and assert the queen-bee to be self-prolific. But for what purpose then should wise nature have furnished the drones with that large quantity of seminal liquor; to what use so large an apparatus of fecundating organs so well described by Reaumur and Maraldi? The fact is, that the above gentlemen have founded their opinion upon observations that hives are peopled at a time of the year when (as they suppose) there are no drones in being. But we have already noticed, that nature has provided drones of different sizes for the purpose of impregnation, adapted to different times, occasions, and circumstances: And the mistake of Messrs Schirach and Hattorff seems to have proceeded from their missing the large-sized drones, and not being acquainted with or not adverting to the other sort so hardly distinguishable from the working bees.

† Hist. Acad.
Sc. 1712.
p. 332.

Lastly, many of the ancients as well as moderns have supposed that the eggs of the female bee are not impregnated with the male sperm, while in the body of the creature, but that they are deposited unimpregnated in the cells; and that the male afterwards ejects the male sperm on them as they lie in the cells, in the same manner as the generation of fishes is supposed to be performed by the males impregnating the spawn after it is cast out by the females. M. Maraldi† long since conjectured that this might be the case; and he

was confirmed in his opinion, by observing a liquid whitish substance surrounding each egg at the bottom of the cell a little while after it has been laid, and that a great number of eggs, which are not encompassed by this liquor, remained barren in the cell.

This method of impregnation has been lately established beyond all contradiction by the observations of Mr Debrow of Cambridge*. Having put some bees into glass-hives with a large number of drones, he observed on the first or second day (always before the third) from the time in which the eggs were placed in the cells, which the queen generally lays on the fourth or fifth day after they are put into the hive, that a great number of bees fastened themselves to one another, and formed a kind of curtain from the top to the bottom of the hive, probably in order to conceal the process of generation. Mr Debrow, however, could soon perceive several bees, whose size he was not able to distinguish, inserting the posterior part of their bodies each into a cell, and sinking into it; after a little while they retired, and he could see with the naked eye a small quantity of whitish liquor left in the angle of the base of each cell, containing an egg; this liquor was less liquid than honey, and had no sweet taste.

In order to prove further that the eggs are fecundated by the males, and that their presence is necessary at the time of breeding, Mr Debrow made the following experiments. They consist in leaving in a hive the queen, with only the common or working bees, without any drones, to see whether the eggs she laid would be prolific. To this end, he took a swarm, and shook all the bees into a tub of water, leaving them there till they were quite senseless; by which means he could distinguish the drones without any danger of being stung: Leaving these out, therefore, he restored the queen and working-bees to their former state, by spreading them on a brown paper in the sun; after this he replaced them in a glass hive, where they soon began to work as usual. The queen laid eggs, which, to his great surprise, were impregnated; for he imagined he had separated all the drones or males, and therefore omitted watching them; at the end of twenty days he found several of his eggs had, in the usual course of changes, produced bees, while some had withered away, and others were covered with honey. Hence he inferred, that some of the males had escaped his notice, and impregnated part of the eggs. To convince himself of this, he took away all the brood comb that was in the hive, in order to oblige the bees to provide a fresh quantity, being determined to watch narrowly their motions after new eggs should be laid in the cells. On the second day after the eggs were placed in the cells, he perceived the same operation that was mentioned before; namely, that of the bees hanging down in the form of a curtain, while others thrust the posterior part of the body into the cells. He then introduced his hand into the hive, and broke off a piece of the comb, in which there were two of these insects: he found in neither of them any sting (a circumstance peculiar to the drones): upon dissection, with the assistance of a microscope, he discovered the four cylindrical bodies which contain the glutinous liquor, of a whitish colour, as observed by Maraldi in the large drones. He was therefore now under a necessity

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* Phil.
Transf. vol.
67. part
i. art. 3.

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Mr De-
brow's ex-
periments
and disco-
veries.

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cessity of repeating his experiments, in destroying the males, and even those which might be suspected to be such.

He once more immersed the same bees in water; and when they appeared in a senseless state, he gently pressed every one, in order to distinguish those armed with stings from those which had none, and which of course he supposed to be males: of these last he found fifty-seven, and replaced the swarm in a glass hive, where they immediately applied again to the work of making cells; and on the fourth or fifth day, very early in the morning, he had the pleasure to see the queen-bee deposit her eggs in those cells: he continued watching most part of the ensuing days, but could discover nothing of what he had seen before.

The eggs after the fourth day, instead of changing in the manner of caterpillars, were found in the same state they were the first day, except that some were covered with honey. A singular event happened the next day about noon: all the bees left their own hive, and attempted to get into a neighbouring hive, probably in search of males; but the queen was found dead, having been killed in the engagement.

To be further satisfied, Mr Debrow took the brood-comb, which had not been impregnated, and divided it into two parts: one he placed under a glass bell, N^o 1. with honey-comb for the bees food, taking care to leave a queen, but no drones, among the bees confined in it: the other piece of brood-comb he placed under another glass bell, N^o 2. with a few drones, a queen, and a proportionable number of common bees. The result was, that in the glass N^o 1. there was no impregnation, the eggs remained in the same state they were in when put into the glass; and on giving the bees their liberty on the seventh day, they all flew away, as was found to be the case in the former experiment: whereas in the glass N^o 2. the very day after the bees had been put into it, the eggs were impregnated by the drones, the bees did not leave their hives on receiving their liberty, the eggs at the usual time underwent the necessary transformations, and a numerous young colony was produced.

Naturalists have observed, that the queen bees are produced in a manner peculiar to themselves, and different from the drones and working bees. Some have supposed, that the eggs laid by the queen in a hive, and destined for the production of queen bees, are of a peculiar kind: but though this is not the case, as M. Schirach has lately discovered, yet there are particular cells appropriated for this purpose. These cells are generally near the edges, and at the bottom of the combs, and sometimes on the sides of a honey-comb: they are of an oblong orbicular form, and very strong; and are more or less numerous in different hives as occasion seems to require. It has been also supposed, that the matter with which they are nourished is of a different kind and quality from that employed for the nourishment of the other bees; that which has been collected out of the royal cells being of a gummy glutinous nature, of a deep transparent red, and dissolving in the fire rather than crumbling to powder.

It has been generally supposed, that the queen-bee is the only female contained in the hive; and that the working bees are neutral, or of neither sex. But M. Schirach * has lately established a different doc-

trine, which has been also confirmed by the later observations of Mr Debrow †. According to Mr Schirach, all the working or common bees are females in disguise; and the queen-bee lays only two kinds of eggs, viz. those which are to produce the drones, and those from which the working bees are to proceed: and from any one or more of these, one or more queens may be produced; so that every worm of the latter or common kind, which has been hatched about three days, is capable, under certain circumstances, of becoming the queen, or mother of a hive. In proof of this doctrine, new and singular as it may seem, he alleges a number of satisfactory and decisive experiments, which have been since verified by those of Mr Debrow. In the early months of the spring, and in any preceding month, even so late as November, he cut off from an old hive a piece of that part of the comb which contains the eggs of the working bees; taking care, however, that it contained likewise worms which had been hatched about three days. He fixed this in an empty hive, or box, together with a portion of honey-comb, &c. or, in other words, with a sufficiency of food and building materials, or wax, for the use of the intended colony. He then put into, and confined within, the same box, a sufficient number of common working bees, taken from the same or any other hive. As soon as the members of this small community found themselves deprived of their liberty, and without a queen, a dreadful uproar ensued, which continued generally, with some short intervals of silence, for the space of about twenty-four hours; during which time it is to be supposed they were alternately meditating and holding council on the future support of the new republic. On the final cessation of this tumult, the general and almost constant result was, that they betook themselves to work; first proceeding to the construction of a royal cell, and then taking the proper measures for hatching and feeding the brood inclosed within them. Sometimes even on the second day the foundations of one or more royal cells were to be perceived; the view of which furnished certain indications that they had elected one of the inclosed worms to the sovereignty.

The operation has been hitherto conducted in the house. This new colony may now be safely trusted in the garden, if the weather be warm, and have the liberty allowed them of passing out of the box; of which they instantly avail themselves, and are seen in a short time almost totally to desert their new habitation. In about two hours, however, they begin to re-enter it. We should not neglect to observe, that if they should be placed near the old hive, from which they were taken, they will very often attempt to enter it, but are as constantly repulsed by their former companions and brethren. It is prudent, therefore, to place them at a distance from the mother state, in order to avoid the inconveniences of a civil war. The final result of the experiment is, that the colony of working bees thus shut up, with a morsel of common brood, not only hatch it, but are found, at the end of eighteen or twenty days, to have produced from thence one or two queens; which have apparently proceeded from worms of the common sort, pitched upon by them for that purpose; and which, under other circumstances, that is, if they had remained in the old hive, there is reason to suppose would have been changed into com-

Bee.

† *Phil. Trans.* vol. 67. parti. 21.
Mr Schirach's discoveries.

* *Hist. Nat. de la Reine des Abeilles, &c.*

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mon working bees. In the present instance, the common worm appears to be converted by them into a queen bee, merely because the hive was in want of one. Hence we may justly infer, that the kingdom of the bees is not, if the expression may be used, a *jure divino* or hereditary monarchy, but an elective kingdom; in which the choice of their future ruler is made by the body of the people, while she is yet in the cradle, or in embryo; and who are determined by motives of preference which will perhaps for ever elude the penetration of the most sagacious naturalists.

The conclusions drawn by M. Schirach, from experiments of the preceding kind, often repeated by himself and others with the same success, are, that all the common or working bees were originally of the female sex; but that when they have undergone their last metamorphosis, they are condemned to a state of perpetual virginity, and the organs of generation are obliterated; merely because they have not been lodged, fed, and brought up in a particular manner, while they were in the worm state. He supposes that the worm, designed by the community to be a queen, or mother, owes its metamorphosis into a queen, partly to the extraordinary size of its cell, and its peculiar position in it; but principally to a certain appropriate nourishment found there, and carefully administered to it by the working bees while it was in the worm state; by which, and possibly other means unknown, the development and extension of the germ of the female organs, previously existing in the embryo, is effected; and those differences in its form and size are produced, which afterwards so remarkably distinguish it from the common working bees.

This discovery is capable of being applied towards forming artificial swarms, or new colonies of bees, by which means their number might be increased, and their produce in honey and wax proportionably augmented.

Explanation of Plate XCVI. Fig. 1. is the queen-bee. 2. Is the drone. 3. Is the working bee. 4. Represents the bees hanging to each other by the feet, which is the method of taking their repose. 5. The proboscis or trunk, which is one of the principal organs of the bees, wherewith they gather the honey and take their nourishment. 6. One of the hind-legs of a working bee, loaded with wax. 7. A comb, in which the working-bees are bred. The cells are the smallest of any. Two of them have the young bees inclosed. A royal cell is suspended on one side. 8. A comb in which the drones are bred, being larger than the former; the young drones being included in several of them; with two royal cells suspended on the side. 9. A similar comb, in which the royal cell is fixed in the middle of the comb; and several common cells are sacrificed to serve as a basis and support to it. In general, the royal cells are suspended on the side of a comb, as in fig. 7, 8. To the side of fig. 9. two royal cells are begun, when they resemble pretty much the cup in which an acorn lies. The other royal cells have the young queens included in them. Fig. 10. exhibits the sting and all its parts. The sting is composed of a sheath or case, and two shanks, united to each other, and terminating in a sharp point, so as to look like a single part. *b*, The poisonous bag,

c, The tube that serves to convey the poison from its bag to the thickest part of the sting's sheath. *dd*, The two shanks of the sting, mutually conveying to each other. *ee*, The sheath of the sting. *ff*, The thickest end of the sheath, where the tube opens into it, by which it receives the insect's poison. *g*, The extreme point of the sting, formed by the two shanks of that organ, that are in this place closely united. *hh*, The beards with which the shanks of the sting are armed at their extremities. *i*, The tube that serves to secrete the poison, which it discharges into the poison-bag. *kk*, The two blind extremities of the said tube. *llll*, Two pair of cartilages, of different forms, which are for the most part of a deep black, and articulated among themselves and with the shanks of the sting. *mm*, Two other cartilages less conspicuous than the former, with one pair of which they are articulated. These two cartilages *mm*, are almost entirely of a membranaceous substance. *nnnnnnnn*, Eight places in which the foregoing cartilages are articulated among themselves, and with the shanks of the sting *dd*. *oooo*, Four muscles serving to move the sting different ways, by the assistance of the same cartilages. *pp*, Two muscles which draw the shanks of the sting into its sheath. *qq*, Two appendages of the sting which are moved along with it, and seem to answer no other purpose but that of ornament.—Fig. 11. The ovary.—Fig. 12. Six eggs drawn after nature, and placed on their ends: These eggs are oblong, very slender, but somewhat thicker on their upper parts.—Fig. 13. An egg viewed with a microscope: it resembles the skin of a fish, divested of its scale, but still retaining the marks of their insertion.—Fig. 14. Worms of bees of different sizes, drawn after nature. *a*, A worm newly hatched. *b c d e*, Four worms that received more nourishment, and are more grown. *f g*, Two worms still bigger than the former, having had more time to make use of the nourishment provided for them. They are here represented as they lie doubled in their cells. *h*, A worm placed on its belly, so as to show on its back a black line, inclining to a light blue or grey. This line denotes the stomach, which appears in this place through the transparent parts that lie over it. *i*, A worm lying on its back, and beginning to draw in the hinder part of its body, and move its head.—Fig. 15. A full-grown worm, viewed with a microscope. *aa*, Its 14 annular incisions or divisions. *b*, The head and eyes, &c. *ccc*, Ten breathing-holes.—Fig. 16. The worm forming its web. *aa*, The sides of the cell that contain it. *b*, The bottom of the cell. *c*, The entrance or door of the cell. The worm is here represented as making its web in the properest manner to shut up this entrance.—Fig. 17. Worm taken out of the web in which it had inclosed itself, and just ready to cast its skin.—Fig. 18. A cell containing the worm changed into a nymph, and perfectly lined with the said worm's web. Likewise the said web entire, with the nymph contained in it, as they appear on opening the cell. *aa*, The sides of the cell, lined with the worm's web. *b*, The mouth of the cell, perfectly closed by the web. *c*, The bottom of the cell. *d*, The web entire, as it appears on opening the cell, which it greatly resembles in form. *e*, The upper part of the web, of a convex form. This part

Bee.

Bee.

part shows its filaments pretty distinctly. *f*, The inclosed nymph appearing through the transparent sides of the web. *g*, The bottom of the web, answering to that of the wax-cell.—Fig. 19. Worm changed to a nymph, of its natural size and form, yet so as to exhibit its limbs, which are folded up in a most wonderful manner.—Fig. 20. The nymph of the bee viewed with the microscope, displaying in a distinct manner all the parts of the inclosed insect, and the beautiful manner in which they are laid up. *a*, The head, bloated with humours. *bb*, The eyes, projecting considerably. *cc*, The horns, or antennæ. *d*, The lip. *ee*, The teeth, or jaw-bones. *ff*, The first pair of joints belonging to the proboscis. *b*, The proboscis itself. *ii*, The first pair of legs. *kk*, Two transparent stiff little parts, lying against the lowest joints of the first pair of legs. These little parts are not to be found as they remain in the skin it sheds on quitting the nymph state. *ll*, The second pair of legs. *mm*, The wings. *nn*, The blade-bones. *oo*, The last pair of leggs. *pp*, The abdominal rings. *q*, (*g*) The hinder part of the body. The sting projects a little in this place. *r*, Two little parts accompanying the sting. *s*, The anus—Fig. 21. *a*, A cell full of bees-bread, placed in layers. *b*, Little grains, of which the said substance, viewed with the microscope, appears to consist.

II. Of the *MANAGEMENT* of *BEEES*, and most approved *Inventions* for saving their *Lives* while we take their *Honey* and *Wax*.

²²
Of the api-
ary.

I. Of the *Apiary*, and *Hives*. Columella directs that the apiary face the south, and be situated in a place neither too hot nor too much exposed to the cold: that it be in a valley, in order that the loaded bees may with the greater ease descend to their homes: that it be near the mansion-house, on account of the conveniency of watching them; but so situated as not to be exposed to noisome smells, or to the din of men or cattle: that it be surrounded with a wall, which however should not rise above three feet high: that, if possible, a running stream be near them; or, if that cannot be, that water be brought near them in troughs, with pebbles or small stones in the water, for the bees to rest on while they drink; or that the water be confined within gently declining banks, in order that the bees may have safe access to it; they not being able to produce either combs, honey, or food for their maggots, without water: that the neighbourhood of rivers or basins of water with high banks be avoided, because winds may whirl the bees into them, and they cannot easily get on shore from thence to dry themselves; and that the garden in which the apiary stands be well furnished with such plants as afford the bees plenty of good pasture. The trees in this garden should be of the dwarf kind, and their heads bushy, in order that the swarms which settle on them may be the more easily hived.

The proprietor should be particularly attentive that the bees have also in their neighbourhood such plants as yield them plenty of food. Columella enumerates many of these fitted to a warm climate: among them he mentions thyme, the oak, the pine, the sweet-smelling cedar, and all fruit-trees. Experience has taught us, that furze, broom, mustard, clover, heath, &c. are

excellent for this purpose. Pliny recommends broom, in particular, as a plant exceedingly grateful and very profitable to bees.

With regard to hives, those made of straw are generally preferred, on several accounts: they are not liable to be over-heated by the rays of the sun; they keep out cold better than wood or any other materials; and the cheapness renders the purchase of them easy. As the ingenious Mr Wildman's hives are reckoned to be of a preferable construction to any other, we shall give an account of them in his own words.

"My hives (says he) are seven inches in height and ten in width. The sides are upright, so that the top and bottom are of the same diameter. A hive holds nearly a peck. In the upper row of straw there is a hoop of about half an inch in breadth; to which are nailed five bars of deal, full a quarter of an inch in thickness, and an inch and quarter wide, and half an inch asunder from one another; a narrow short bar is nailed at each side, half an inch distant from the bars next them, in order to fill up the remaining parts of the circle; so that there are in all seven bars of deal, to which the bees fix their combs. The space of half an inch between the bars allows a sufficient and easy passage for the bees from one comb to another. In order to give great steadiness to the combs, so that, upon moving the hive, the combs may not fall off, or incline out of their direction, a stick should be run thro' the middle of the hive, in a direction directly across the bars, or at right angles with them. When the hives are made, a piece of wood should be worked into the lower row of straw, long enough to allow a door for the bees, of four inches in length, and half an inch in height.

"The proprietor of the bees should provide himself with several flat covers of straw, worked of the same thickness as the hives, and a foot in diameter, that so it may be of the same width as the outside of the hives. Before the cover is applied to the hive, a piece of clean paper, of the size of the top of the hive, should be laid over it; and a coat of cow-dung, which is the least apt to crack of any cement easily to be obtained, should be laid all round the circumference of the hive. Let the cover be laid upon this, and made fast to the hive with a packing-needle and pack-thread, so that neither cold nor vermin may enter.

"Each hive should stand single on a piece of deal, or other wood, somewhat larger than the bottom of the hive: That part of the stand which is at the mouth of the hive should project some inches, for the bees to rest on when they return from the field. This stand should be supported upon a single post, two and a half feet high; to which it should be screwed very securely, that high winds, or other accidents, may not blow down both stand and hive. A quantity of foot mixed with barley chaff should be strewed on the ground round the post; which will effectually prevent ants, slugs, and other vermin, from rising up to the hive. The foot and chaff should from time to time be renewed as it is blown or washed away; though, as it is sheltered by the stand, it remains a considerable time, especially if care be taken that no weeds rise through it. Weeds, indeed, should not be permitted to rise near the hive; for they may give shelter to vermin which may be hurtful to the bees.

R 2

"The

Bee.

²³
Of hives.

Bee.

"The stands for bees should be four yards asunder; or if the apiary will not admit of so much, as far asunder as may be, that the bees of one hive may not interfere with those of another hive, as is sometimes the case when the hives are near one another or on the same stand; for the bees, mistaking their own hives, light sometimes at the wrong door, and a fray ensues, in which one or more may lose their lives.

24
Of the proper season for purchasing hives of bees.

"The person who intends to erect an apiary should purchase a proper number of hives at the latter part of the year, when they are cheapest. The hives should be full of combs, and well stored with bees. The purchaser should examine the combs, in order to know the age of the hives. The combs of that season are white, those of the former year are of a darkish yellow; and where the combs are black, the hive should be rejected, because old hives are most liable to vermin and other accidents.

"If the number of hives wanted were not purchased in the autumn, it will be necessary to remedy this neglect after the severity of the cold is past in the spring. At this season, bees which are in good condition will get into the fields early in the morning, return loaded, enter boldly, and do not come out of the hive in bad weather; for when they do, this indicates they are in great want of provisions. They are alert on the least disturbance, and by the loudness of their humming we judge of their strength. They preserve their hives free from all filth, and are ready to defend it against every enemy that approaches.

"The summer is an improper time for buying bees, because the heat of the weather softens the wax, and thereby renders the combs liable to break, if they are not very well secured. The honey, too, being then thinner than at other times, is more apt to run out of the cells; which is attended with a double disadvantage, namely, the loss of the honey, and the daubing of the bees, whereby many of them may be destroyed. A first and strong swarm may indeed be purchased; and, if leave can be obtained, permitted to stand in the same garden till the autumn; but, if leave is not obtained, it may be carried away in the night after it has been hived.

"I suppose, that, in the stocks purchased, the bees are in hives of the old construction. The only direction here necessary is, that the first swarm from these stocks should be put into one of my hives; and that another of my hives should in a few days be put under the old stock, in order to prevent its swarming again."

25
Of hiving the swarms.

2. *Of Hiving.* Bees, as has been already observed, never swarm till the hive be too much crowded by the young brood. They first begin to swarm in May, or in the end of April, but earlier or later according to the warmth of the season. They seldom swarm before ten in the morning, and seldom later than three in the afternoon. We may know when they are about to swarm, by clusters of them hanging on the outside of the hive, and by the drones appearing abroad more than usual: But the most certain sign is, when the bees refrain from flying into the fields, though the season be inviting. Just before they take flight, there is an uncommon silence in the hive; after this, as soon as one takes flight, they all follow. Before the subsequent swarmings, there is a great noise in the hive, which is

supposed to be occasioned by a contest whether the young or the old queen should go out. When the bees of a swarm fly too high, they are made to descend lower, by throwing handfuls of sand or dust among them, which they probably mistake for rain. For the same purpose, it is usual to beat on a kettle or frying-pan: This practice may have taken its rise from observing that thunder or any great noise prompts such bees as are in the fields to return home.

As soon as the swarm is settled, the bees which compose it should be got into a hive with all convenient speed, to prevent their taking wing again. If they settle on a small branch of a tree, easy to come at, it may be cut off and laid upon a cloth; the hive being ready immediately to put over them. If the branch cannot be conveniently cut, the bees may be swept from off it into a hive. Lodge but the queen into the hive, and the rest will soon follow. If the bees must be considerably disturbed in order to get them into a hive, the most advisable way is to let them remain in the place where they have pitched till the evening, when there is less danger of their taking wing. If it be observed that they still hover about the place they first alighted upon, the branches there may be rubbed with rue, or alder-leaves, or any other thing distasteful to them, to prevent their returning to it.

The hive employed on this occasion should be cleaned with the utmost care, and its inside be rubbed very hard with a coarse cloth, to get off the loose straws, or other impurities, which might cost them a great deal of time and labour to gnaw away. It may then be rubbed with fragrant herbs or flowers, the smell of which is agreeable to the bees; or with honey.

The hive should not be immediately set on the stool where it is to remain; but should be kept near the place at which the bees settled, till the evening, lest some stragglers should be lost. It should be shaded either with boughs or with a cloth, that the too great heat of the sun may not annoy the bees.

We sometimes see a swarm of bees, after having left their hive, and even alighted upon a tree, return to their first abode. This never happens but when the young queen did not come forth with them, for want of strength, or perhaps courage to trust her wings for the first time; or possibly from a consciousness of her not being impregnated.

When a swarm is too few in number for a hive, another may be added. The usual method of thus uniting swarms is very easy. Spread a cloth at night upon the ground close to the hive in which the two casts or swarms are to be united; lay a stick across this cloth; then fetch the hive with the new swarm, set it over the stick, give a smart stroke on the top of the hive, and all the bees will drop down upon the cloth in a cluster. This done, throw aside the empty hive, take the other from off the stool, and set this last over the bees, who will soon ascend into it, mix with those already there, and become one and the same family. Others, instead of striking the bees down upon the cloth, place with its bottom upmost the hive in which the united swarms are to live, and strike the bees of the other hive down into it. The former of these hives is then restored to its natural situation, and the bees of both hives soon unite. If some bees still adhere to the other hive, they may be brushed off on the cloth, and they

Bee.

26
Of uniting swarms.

BEE.
Fig. 4.

Fig. 1. Fig. 2. Fig. 3.



Fig. 5.



Fig. 12.

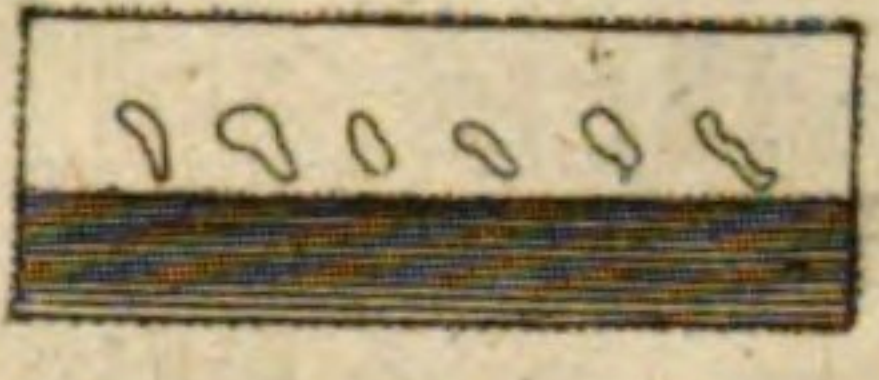


Fig. 16.



Fig. 17.



Fig. 6.



Fig. 14.



Fig. 7.

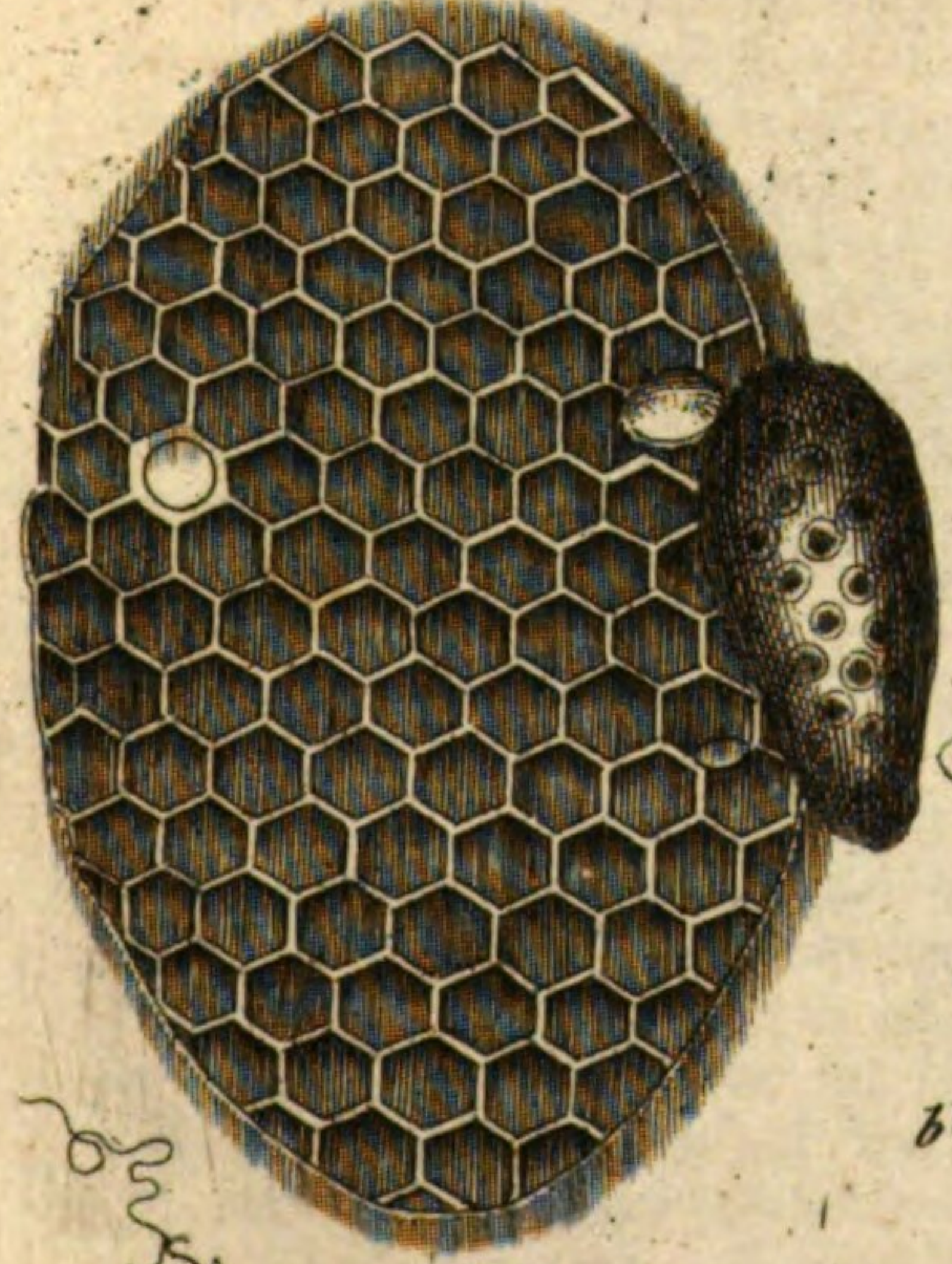


Fig. 21.

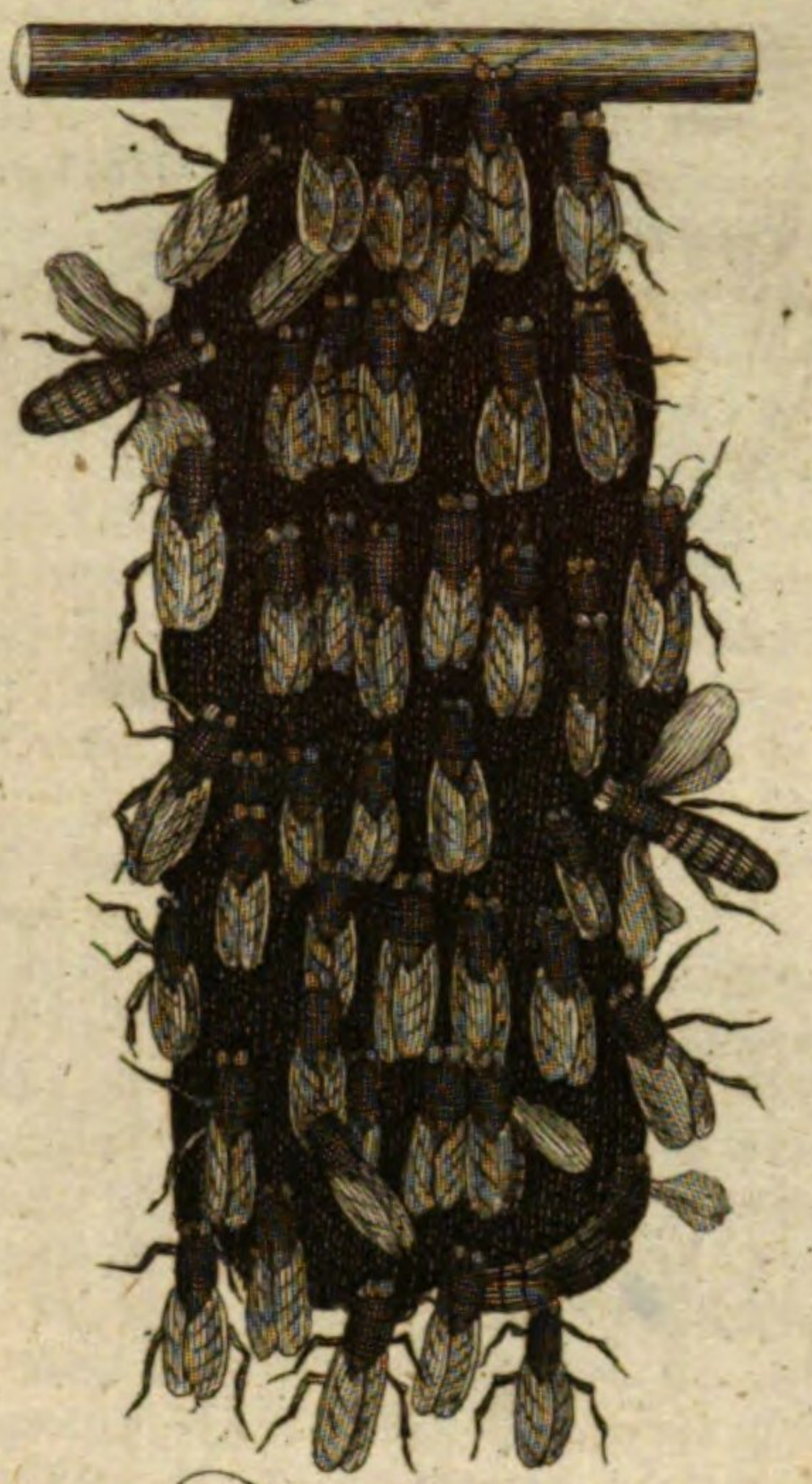


Fig. 8.

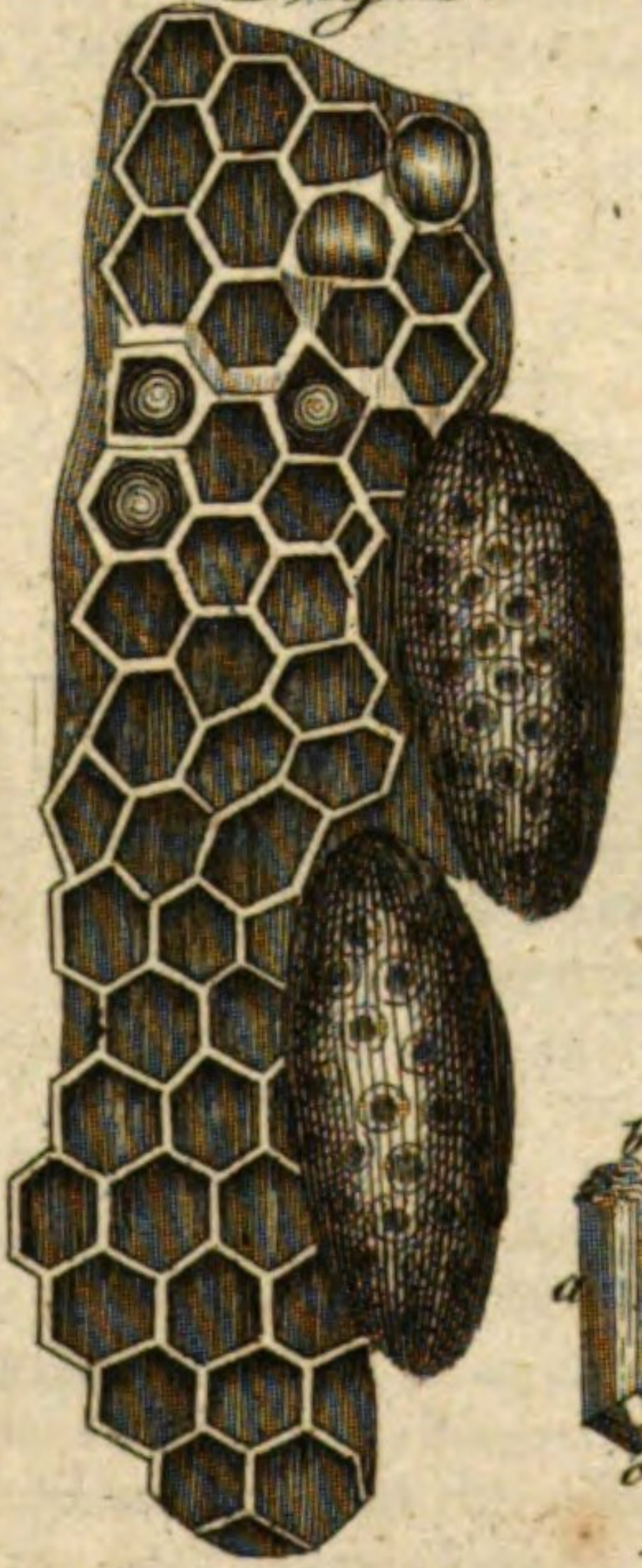


Fig. 10.

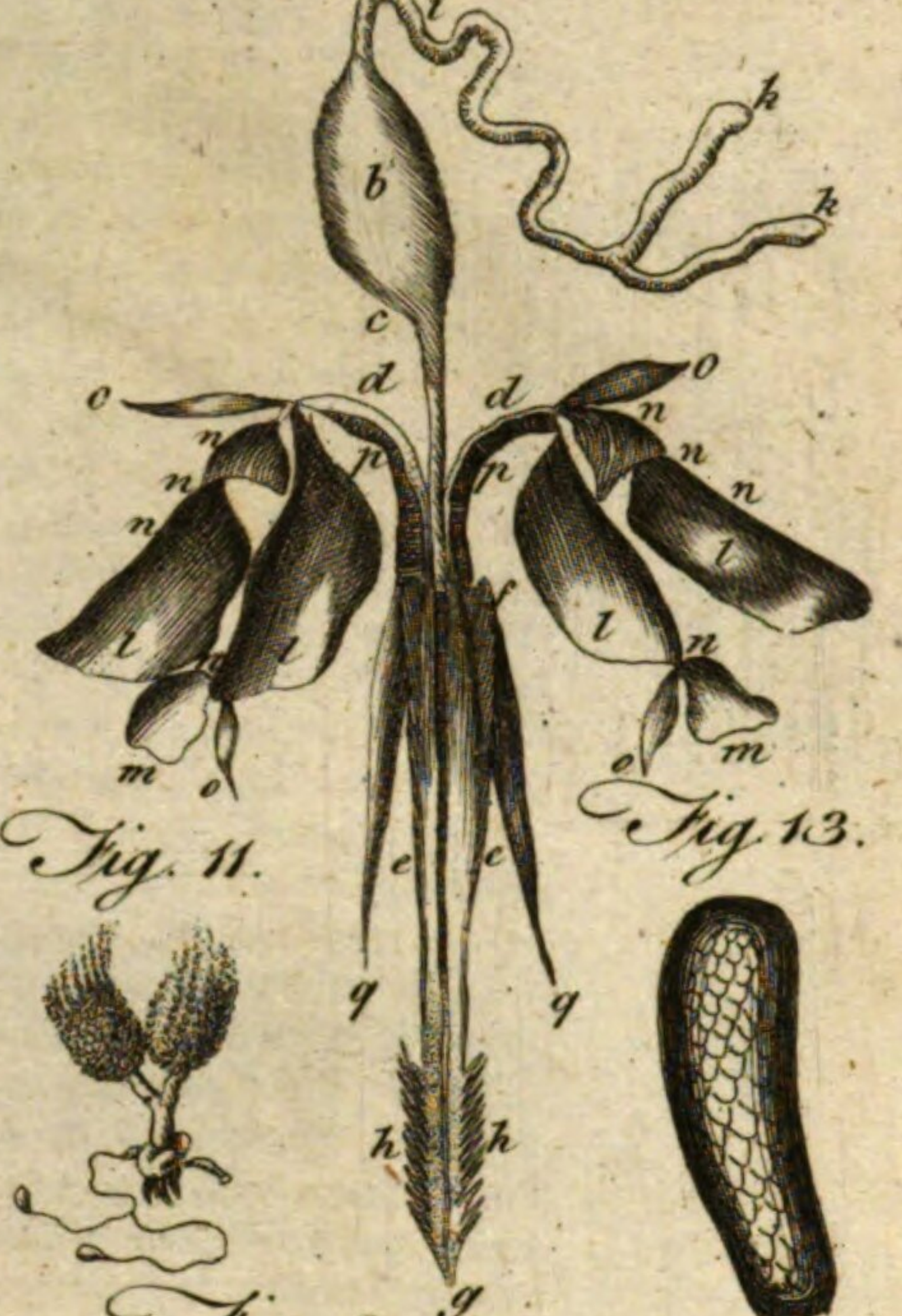


Fig. 11.



Fig. 13.



Fig. 9.

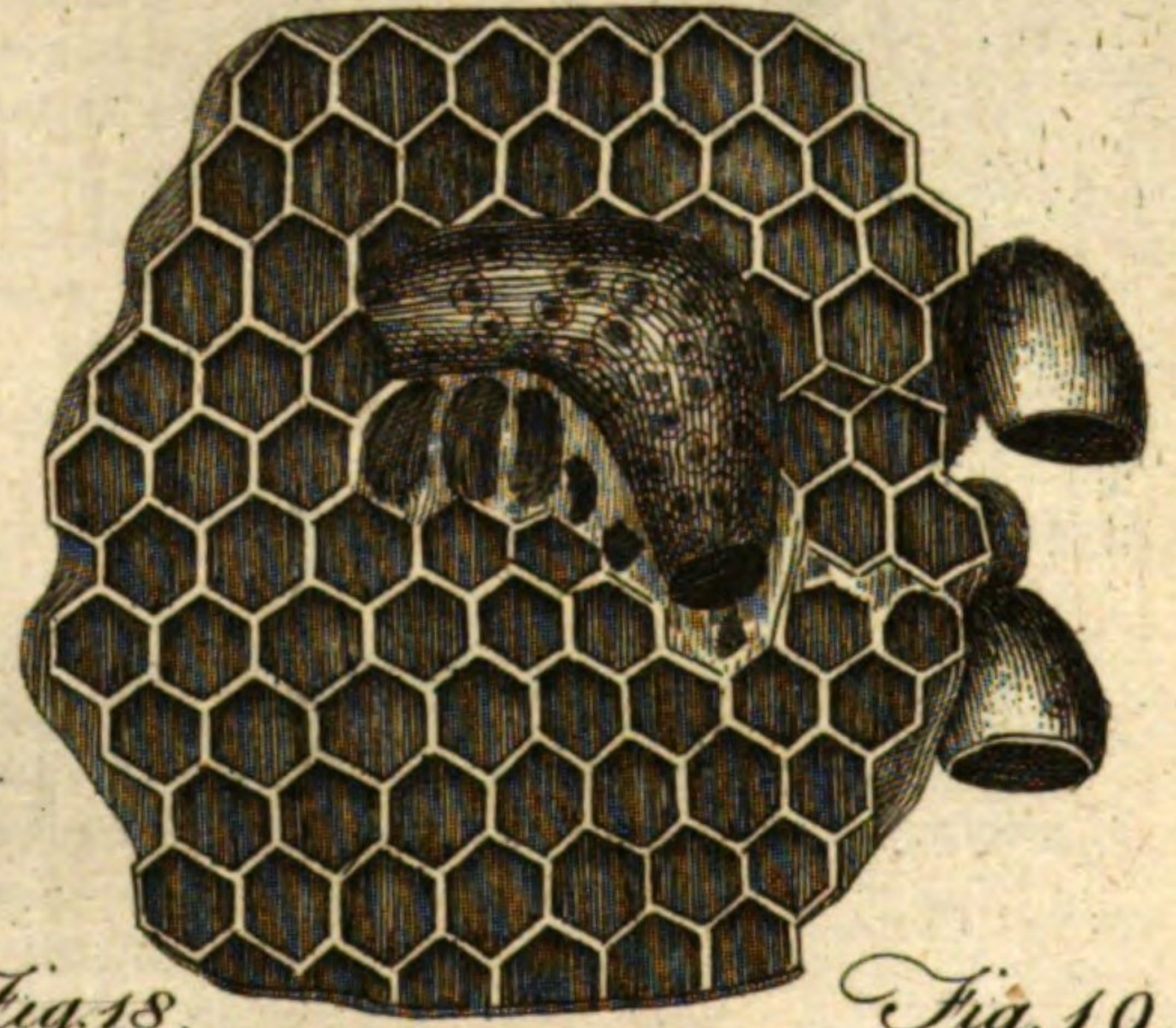


Fig. 18.



Fig. 19.



Fig. 20.

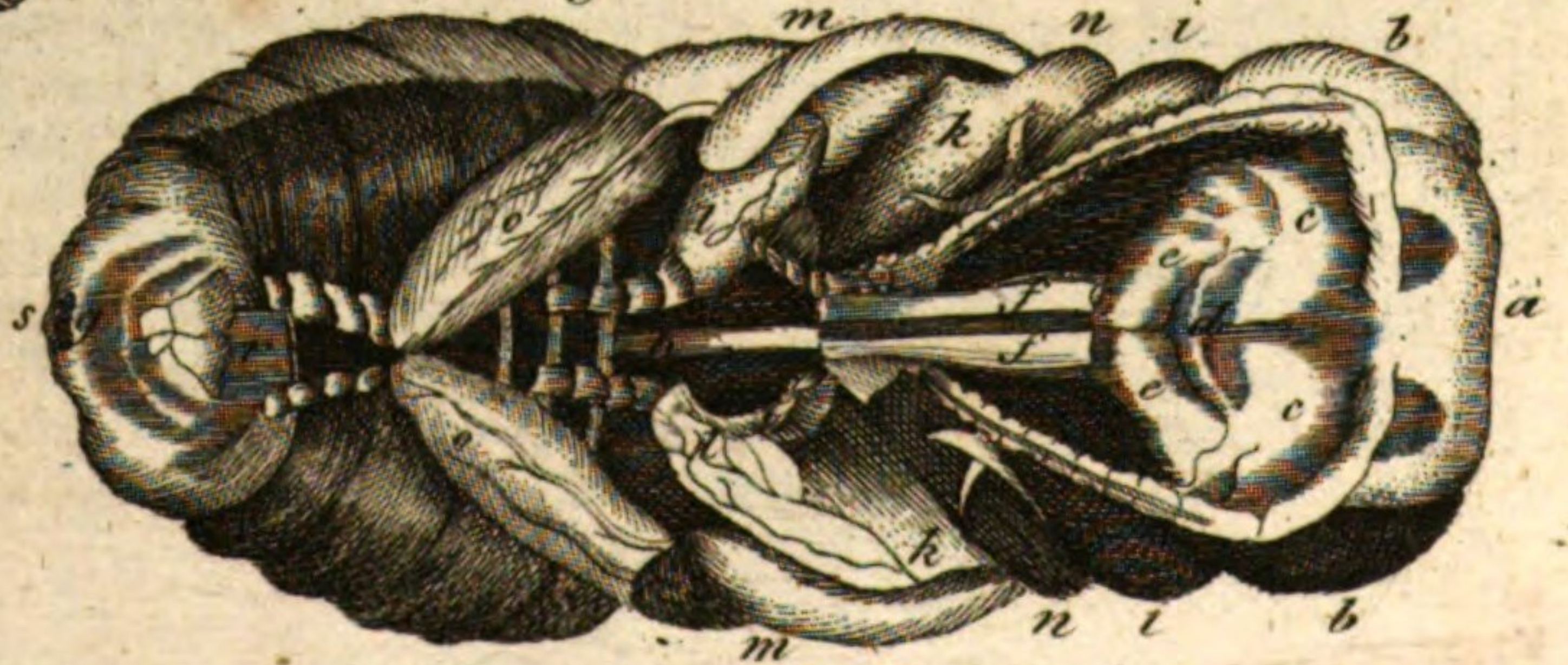
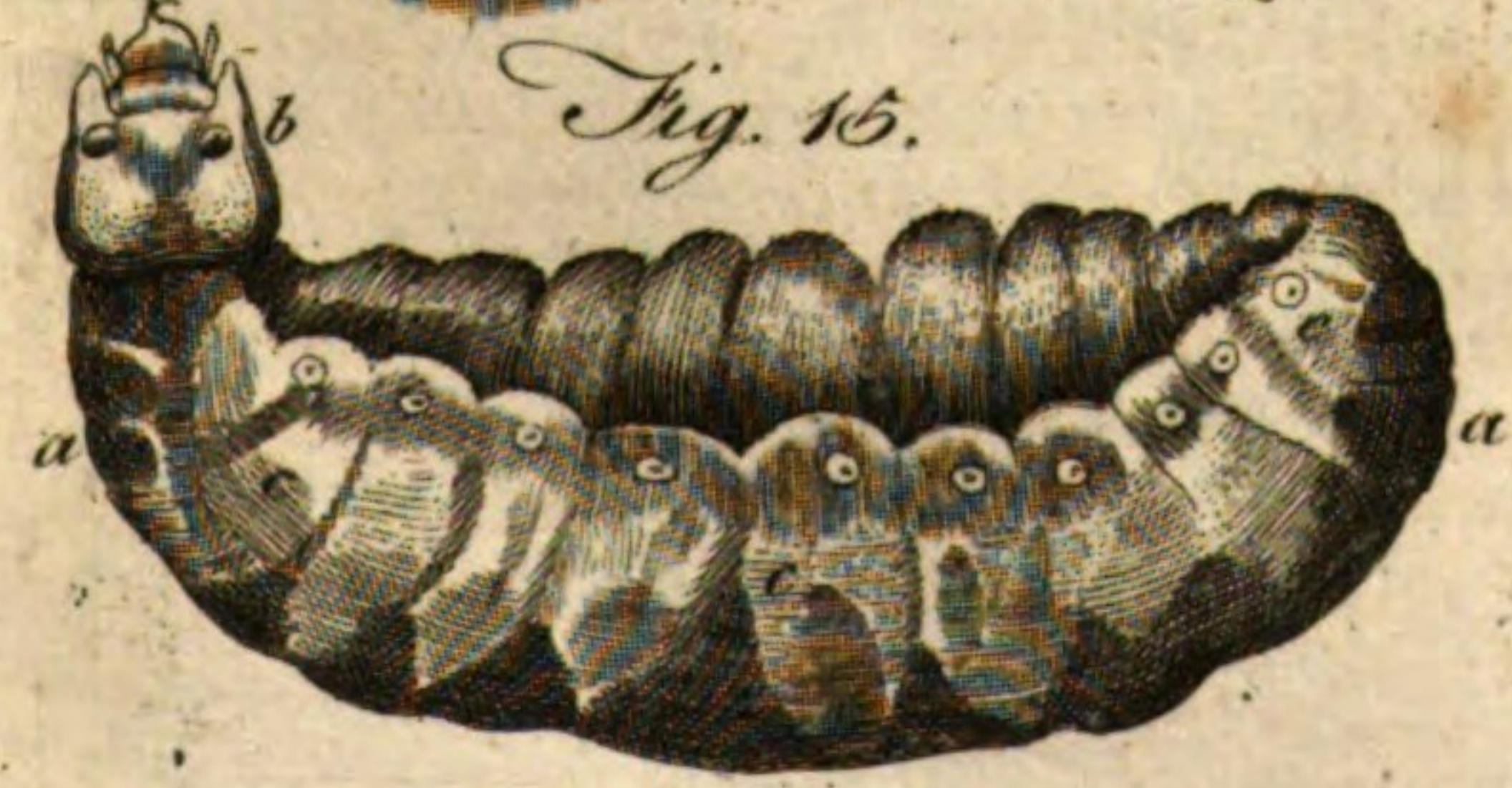


Fig. 15.



Bee.

they will soon join their brethren. Or one may take the following method, which gives less disturbance to the bees. Set with its mouth upmost the hive into which the young swarm has been put, and set upon it the other hive. The bees in the lower hive, finding themselves in an inverted situation, will soon ascend into the upper.

Though all writers acknowledge, that one of the queens is constantly slain on these occasions, and generally a considerable number of the working bees; yet none of them, Columella excepted, has proposed the easy remedy of killing the queen of the latter cast or swarm before the union is made; a means by which the lives of the working bees may be preserved. This may be done either by intoxicating them and then picking her out, or by searching her out when the bees are beaten down upon the cloth; for this being done in the night, to prevent the battle which might otherwise ensue, there will be no great difficulty in finding her.

A large swarm may weigh eight pounds, and so gradually less, to one pound: consequently a very good one may weigh five or six pounds. All such as weigh less than four pounds should be strengthened by uniting to each of them a less numerous swarm. The size of the hive should be proportioned to the number of the bees; and, as a general rule, it should be rather under than over sized, because bees require to be kept warmer than a large hive will admit of.

27
Bee-hunt-
ing in A-
merica.

In the *Letters from an American Farmer*, we have the following entertaining account of the swarming of bees, their flight into the woods, and the method of discovering them there. A little experience renders it easy to predict the time of their swarming: but the "difficult point is, when on the wing, to know whether they want to go to the woods or not. If they have previously pitched in some hollow trees, it is not the allurements of salt and water, of fennel, hickory leaves &c. nor the finest box, that can induce them to stay. They will prefer those rude, rough, habitations, to the best polished mahogany hive. When that is the case with mine, I seldom thwart their inclinations. It is in freedom that they work. Were I to confine them, they would dwindle away and quit their labour. In such excursions we only part for a while. I am generally sure to find them again the following fall. This elopement of theirs only add to my recreations. I know how to deceive even their superlative instinct. Nor do I fear losing them, though 18 miles from my house, and lodged in the most lofty trees in the most impervious of our forests. After I have done sowing, by way of recreation I prepare for a week's jaunt in the woods, not to hunt either the deer or the bears, as my neighbours do, but to catch the more harmless bees. I cannot boast that this chase is so noble or so famous among men: but I find it less fatiguing, and full as profitable; and the last consideration is the only one that moves me. I take with me my dog, as a companion, for he is useless as to this game; my gun, for no one ought to enter the woods without one; my blanket, some provisions, some wax, vermilion, honey, and a small pocket-compass. With these implements I proceed to such woods as are at a considerable distance from any settlements. I carefully examine whether they abound with large trees; if so, I make

Bee.

a small fire, on some flat stones, in a convenient place. On the fire I put some wax: close by this fire, on another stone, I drop honey in distinct drops, which I surround with small quantities of vermilion, laid on the stone; and then I retire carefully to watch whether any bees appear. If there are any in that neighbourhood, I rest assured that the smell of the burnt wax will unavoidably attract them. They will soon find out the honey, for they are fond of preying on that which is not their own; and in their approach, they will necessarily tinge themselves with some particles of vermilion, which will adhere long to their bodies. I next fix my compass, to find out their course; which they keep invariably straight, when they are returning home loaded. By the assistance of my watch, I observe how long those are returning which are marked with vermilion. Thus possessed of the course, and, in some measure, of the distance, which I can easily guess at, I follow the first, and seldom fail of coming to the tree where those republics are lodged. I then mark it; and thus, with patience, I have found out sometimes 11 swarms in a season; and it is inconceivable what a quantity of honey these trees will sometimes afford. It entirely depends on the size of the hollow, as the bees never rest or swarm till it is replenished; for, like men, it is only the want of room that induces them to quit the maternal hive. Next I proceed to some of the nearest settlements, where I procure proper assistance to cut down the trees, get all my prey secured, and then return home with my prize. The first bees I ever procured were thus found in the woods by mere accident; for, at that time, I had no kind of skill in this method of tracing them. The body of the tree being perfectly found, they had lodged themselves in the hollow of one of its principal limbs, which I carefully sawed off, and, with a good deal of labour and industry, brought it home, where I fixed it up in the same position in which I found it growing. This was in April. I had five swarms that year, and they have been ever since very prosperous. This business generally takes up a week of my time every fall, and to me it is a week of solitary ease and relaxation."

3. *Of shifting the Abode of Bees.* Great improvements may certainly be made in the essential article of providing plenty of pasture for bees, whenever this subject shall be more carefully attended to than has hitherto been. A rich corn country is well known to be a barren desert to them during the most considerable part of the year; and therefore the practice of other nations, in shifting the places of abode of their bees, well deserves our imitation.

Columella informs us, that, as few places are so happily situated as to afford the bees proper pasture both in the beginning of the season and also in the autumn, it was the advice of Celsus, that, after the vernal pastures are consumed, the bees should be transported to places abounding with autumnal flowers; as was practised by conveying the bees from Achaia to Attica, from Eubœa and the Cyclad islands to Scyrus; and also in Sicily, where they were brought to Hybla from other parts of the island. Lib. ix. c. 14.

We find by Pliny, that this was likewise the practice of Italy in his time. "As soon," says he, "as the spring-food for bees has failed in the valleys near our

28

Shifting
the bees
in search
of pasture.

Lib. ix. c. 14.

Lib. xxi. c. 12.

Bee.

our towns, the hives of bees are put into boats, and carried up against the stream of the river, in the night, in search of better pasture. The bees go out in the morning in quest of provisions, and return regularly to their hives in the boats, with the stores they have collected. This method is continued, till the sinking of the boats to a certain depth in the water shows that the hives are sufficiently full; and they are then carried back to their former homes, where their honey is taken out of them." And this is still the practice of the Italians who live near the banks of the Po, (the river which Pliny instanced particularly in the above-quoted passage).

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p. 24.

M. Maillet relates, in his curious Description of Egypt, that, "spite of the ignorance and rusticity which have got possession of that country, there yet remain in it several footsteps of the industry and skill of the ancient Egyptians. One of their most admirable contrivances is, their sending their bees annually into distant countries, in order to procure them sustenance there, at a time when they could not find any at home; and their afterwards bringing them back, like shepherds who should travel with their flocks, and make them feed as they go. It was observed by the ancient inhabitants of Lower Egypt, that all plants blossomed, and the fruits of the earth ripened, above six weeks earlier in Upper Egypt than with them. They applied this remark to their bees; and the means then made use of by them, to enable these usefully industrious insects to reap advantage from the more forward state of nature there, were exactly the same as are now practised, for the like purpose, in that country. About the end of October, all such inhabitants of the Lower Egypt as have hives of bees, embark them on the Nile, and convey them up that river quite into Upper Egypt; observing to time it so that they arrive there just when the inundation is withdrawn, the lands have been sown, and the flowers begin to bud. The hives thus sent are marked and numbered by their respective owners, and placed pyramidically in boats prepared for the purpose. After they have remained some days at their farthest station, and are supposed to have gathered all the wax and honey they could find in the fields within two or three leagues around; their conductors convey them in the same boats two or three leagues lower down, and there leave the laborious insects so long time as is necessary for them to collect all the riches of this spot. Thus, the nearer they come to the place of their more permanent abode, they find the productions of the earth, and the plants which afford them food, forward in proportion. In fine, about the beginning of February, after having travelled through the whole length of Egypt, gathering all the rich produce of the delightful banks of the Nile, they arrive at the mouth of that river, towards the ocean; from whence they set out, and from whence they are now returned to their several homes: for care is taken to keep an exact register of every district from whence the hives were sent in the beginning of the season, of their numbers, of the names of the persons who sent them, and likewise of the mark or number of the boat in which they were placed."

In many parts of France, floating bee-houses are very common. They have on board one barge, three-score or an hundred bee-hives, well defended from the inclemency of an accidental storm. With these the

owners suffer themselves to float gently down the river, the bees continually choosing their flowery pasture along the banks of the stream; and thus a single-floating bee-house yields the proprietor a considerable income.

They have also a method of transporting their bees by land, well worth our imitation in many parts of this kingdom. Their first care is, to examine those hives, some of whose honey-combs might be broken or separated by the jolting of the vehicle; they are made fast one to the other, and against the sides of the hive, by means of small sticks, which may be disposed differently as occasion will point out. This being done, every hive is set upon a packing-cloth, or something like it, the threads of which are very wide; the sides of this cloth are then turned up and laid on the outside of each hive, in which state they are tied together with a piece of small pack-thread wound several times round the hive. As many hives as a cart built for that purpose will hold, are afterwards placed in this vehicle. The hives are set two and two, the whole length of the cart. Over these are placed others; which make, as it were, a second story or bed of hives. Those which are stored with combs should always be turned topsyturvy. It is for the sake of their combs, and to fix them the better, that they are disposed in this manner; for such as have but a small quantity of combs in them, are placed in their natural situation. Care is taken in this stowage not to let one hive stop up another, it being essentially necessary for the bees to have air; and it is for this reason they are wrapped up in a coarse cloth, the threads of which were wove very wide, in order that the air may have a free passage, and lessen the heat which these insects raise in their hives, especially when they move about very tumultuously, as often happens in these carts. Those used for this purpose in Yevre, hold from 30 to 48 hives. As soon as all are thus stowed, the caravan sets out. If the season is sultry, they travel only in the night; but a proper advantage is made of cool days. These caravans do not go fast. The horses must not be permitted even to trot; they are led slowly, and through the smoothest roads. When there are not combs in the hives sufficient to support the bees during their journey, the owner takes the earliest opportunity of resting them wherever they can collect wax. The hives are taken out of the cart, then set upon the ground, and after removing the cloth from over them, the bees go forth in search of food. The first field they come to serves them as an inn. In the evening, as soon as they are all returned, the hives are shut up; and being placed again in the cart, they proceed on their journey. When the caravan is arrived at the journey's end, the hives are distributed in the gardens, or in the fields adjacent to the houses of different peasants, who, for a very small reward, undertake to look after them. Thus it is that, in such spots as do not abound in flowers at all seasons, means are found to supply the bees with food during the whole year.

These instances of the great advantages which attend shifting of bees in search of pasture, afford an excellent lesson to many places in this kingdom: they direct particularly the inhabitants of the rich vales, where the harvest for bees ends early, to remove their flocks to places which abound in heath, this plant continuing

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Bee.

Bee.

in bloom during a considerable part of autumn, and yielding great plenty of food to bees. Those in the neighbourhood of hills and mountains will save the bees a great deal of labour, by taking also the advantage of shifting their places of abode.

29
Manage-
ment of
bees in
winter.

4. *Of feeding and defending Bees in Winter.* Providence has ordained, that insects which feed on leaves, flowers, and green succulent plants, are in an insensible or torpid state from the time that the winter's cold has deprived them of the means of subsistence. Thus the bees during the winter are in so lethargic a state, that little food supports them: but as the weather is very changeable, and every warm or sunny day revives them, and prompts them to return to exercise, food becomes necessary on these occasions.

Many hives of bees, which are thought to die of cold in the winter, in truth die of famine; when a rainy summer has hindered the bees from laying in a sufficient store of provisions. The hives should therefore be carefully examined in the autumn, and should then weigh at least 18 pounds.

Columella describes an annual distemper which seizes bees in the spring, when the spurge blossoms, and the elm discloses its seeds; for that, being allured by the first flowers, they feed so greedily upon them, that they surfeit themselves, and die of a looseness, if they are not speedily relieved.

The authors of the *Maison Rustique* impute this purging to the bees feeding on pure honey, which does not form a food sufficiently substantial for them, unless they have bee-bread to eat at the same time; and advise giving them a honey-comb taken from another hive, the cells of which are filled with crude wax or bee-bread.

There is still, however, a want of experiments to ascertain both the time and the manner in which bees should be fed. The common practice is to feed them in the autumn, giving them as much honey as will bring the whole weight of the hive to near 20 pounds. To this end, the honey is diluted with water, and then put into an empty comb, split reeds, or, as Columella directs, upon clean wool, which the bees will suck perfectly dry. But the dilution with water makes the honey apt to be candied, and honey in that state is prejudicial to bees.

Tom I.
P. 435.

The following directions given in the *Maison Rustique* seem to be very judicious. Replenish the weak hives in September with such a portion of combs full of honey taken from other hives as shall be judged to be a sufficient supply for them. In order to do this, turn up the weak hive, after taking the precaution of defending yourself with the smoke of rags, cut out the empty combs, and put the full ones in their place; where secure them with pieces of wood run a-cross, in such manner that they may not fall down when the hive is returned to its place. The bees will soon fix them more effectually. If this method be thought too troublesome, set under the hive a plate of liquid honey, unmixed with water, with straws laid across it, and over these a paper pierced full of holes, through which the bees will suck the honey without daubing themselves. This should be done in cloudy or rainy weather, when the bees stir least abroad; and the hive should be covered, to protect the bees from robbers, who might be allured to it by the smell of the honey.

Another circumstance which may render it very ne-

cessary to feed the bees is, when several days of bad weather ensue immediately after they have swarmed; for then, being destitute of every supply beyond what they carried with them, they may be in great danger of starving. In this case, honey should be given them in proportion to the duration of the bad weather.

The degree of cold which bees can endure has not been ascertained. We find that they live in the cold parts of Russia, and often in hollow trees, without any care being taken of them. Their hives are frequently made of the bark of trees, which does not afford them much protection from cold. Mr White, therefore, judiciously observes, that bees which stand on the north side of a building whose height intercepts the sun's beams all the winter, will waste less of their provisions (almost by half) than others which stand in the sun: for coming seldom forth, they eat little; and yet in the spring are as forward to work and swarm as those which had twice as much honey in the autumn before. The owner should, however, examine their state in the winter; and if he finds, that, instead of being clustered between the combs, they fall down in numbers on the stool or bottom of the hive, the hive should be carried to a warmer place, where they will soon recover. He must be cautious in returning them again to the cold, lest the honey be candied.

Where the winters are extremely severe, the authors of the *Maison Rustique* advises to lay on the bottom of an old cask the depth of half a foot of very dry earth, powdered, and pressed down hard, and to set on this the stool with the hive; then, to preserve a communication with the air, which is absolutely necessary, to cut a hole in the cask, opposite to the mouth of the hive, and place a piece of reed, or of alder made hollow, from the mouth of the hive to the hole in the cask; and after this to cover the hive with more of the same dry earth. If there be any room to fear that the bees will not have a sufficiency of food, a plate with honey, covered as before directed, may be put under the hive. If the number of hives be great, boxes may be made of deals nailed together, deep enough to contain the hives when covered with dry earth. The bees will thus remain all the winter free from any danger from cold, hunger, or enemies.

5. *Of taking the Honey and Wax.* In this country it is usual, in seizing the stores of these little animals, to rob them also of their lives. The common method is, That when those which are doomed for slaughter have been marked out (which is generally done in September), a hole is dug near the hive, and a stick, at the end of which is a rag that has been dipped in melted brimstone, being stuck in that hole, the rag is set on fire, the hive is immediately set over it, and the earth is instantly thrown up all around, so that none of the smoke can escape. In a quarter of an hour, all the bees are seemingly dead; and they will soon after be irrecoverably so, by being buried in the earth that is returned back into the hole. By this last means it is that they are absolutely killed; for it has been found by experiment, that all the bees which have been affected only by the fume of the brimstone, recover again, excepting such as have been singed or hurt by the flame. Hence it is evident, that fume of brimstone might be used for intoxicating the bees, with some few precautions. The heaviest and the lightest

hives

Bee.

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Methods of
taking the
honey and
the wax.
Common
method in
this coun-
try.

Bee.

hives are alike treated in this manner: the former, because they yield the most profit, with an immediate return; and the latter, because they would not be able to survive the winter. Those hives which weigh from 15 to 20 pounds are thought to be the fittest for keeping.

* Vide Columella, lib. ix. c. 15. and Varro de Re Rustica, lib. iii. c. 16.
31
Greek method of sharing the honey with the bees. See Wheeler's Journey into Greece, p. 411.

More humane and judicious methods were practised by the ancients*; and the following simple method is at this day practised in Greece, degenerate as it is. "Mount Hymethus is celebrated for the best honey in all Greece. This mountain was not less famous in times past for bees and admirable honey; the ancients believing that bees were first bred here, and that all other bees were but colonies from this mountain; which if so, we assured ourselves that it must be from this part of the mountain that the colonies were sent; both because the honey here made is the best, and that here they never destroy the bees. It is of a good consistence, of a fair gold-colour, and the same quantity sweetens more water than the like quantity of any other doth. I no sooner knew that they never destroy or impair the stock of bees in taking away their honey, but I was inquisitive to understand their method of ordering the bees; which being an art so worthy the knowledge of the curious, I shall not think it beside the purpose, to relate what I saw, and was informed of to that effect by such as had skill in that place.

Plate
XCVII.

"The hives they keep their bees in are made of willows or osiers, fashioned like our common dust-baskets, wide at top and narrow at the bottom, and plastered with clay or loam within and without. They are set as in fig. 1. with the wide end uppermost. The tops are covered with broad flat sticks, which are also plastered over with clay; and, to secure them from the weather, they cover them with a tuft of straw, as we do. Along each of these sticks, the bees fasten their combs; so that a comb may be taken out whole, without the least bruising, and with the greatest ease imaginable. To increase them in spring-time, that is in March or April, until the beginning of May, they divide them; first separating the sticks on which the combs and bees are fastened, from one another, with a knife: so, taking out the first comb and bees together on each side, they put them into another basket, in the same order as they were taken out, until they have equally divided them. After this, when they are both again accommodated with sticks and plastered, they set the new basket in the place of the old one, and the old one in some new place. And all this they do in the middle of the day, at such time as the greatest part of the bees are abroad; who at their coming home, without much difficulty, by this means divide themselves equally. This device hinders them from swarming and flying away. In August, they take out their honey. This they do in the day-time also, while they are abroad; the bees being thereby, say they, disturbed least: at which time they take out the combs laden with honey, as before; that is, beginning at each outside, and so taking away, until they have left only such a quantity of combs, in the middle, as they judge will be sufficient to maintain the bees in winter; sweeping those bees that are on the combs into the basket again, and then covering it with new sticks and plaster."

The Greek method above related was introduced into France in 1754, as we are informed by M. de Reau-

mur and Du Hamel, in the memoirs of the Royal Academy for that year, p. 331.

Attempts have been made in our own country, to attain the desirable end of getting the honey and wax without destroying the bees; the most approved of which we shall now relate as concisely as possible.

Mr Thorley, in his *Inquiry into the Nature, Order, and Government of Bees*, thinks colonies preferable to hives, for the following reasons: *First*, The more certain preservation of very many thousands of these useful creatures; *secondly*, Their greater strength (which consists in numbers), and consequently their greater safety from robbers; *thirdly*, Their greater wealth, arising from the united labours of the greater number. He tells us, that he has in some summers taken two boxes filled with honey from one colony; and yet sufficient store has been left for their maintenance during the winter; each box weighing 40 pounds. Add to these advantages, the pleasure of viewing them, with the greatest safety, at all seasons, even in their busiest time of gathering, and their requiring a much less attendance in swarming time. The bees thus managed are also more effectually secured from wet and cold, from mice and other vermin.

His boxes are made of deal, which, being spongy, sucks up the breath of the bees sooner than a more solid wood would do. Yellow dram-deal thoroughly seasoned is the best.

An octagon, being nearer to a sphere, is better than a square form; for as the bees, in winter, lie in a round body near the centre of the hive, a due heat is then conveyed to all the out-parts, and the honey is kept from candying.

The dimensions which Mr Thorley, after many years experience, recommends for the boxes, are 10 inches depth, and 12 or 14 inches breadth in the inside. He has tried boxes containing a bushel or more, but found them not to answer the design like those of a lesser size. The larger are much longer in filling; so that it is later ere you come to reap the fruits of the labour of the bees: nor is the honey there so good and fine, the effluvia even of their own bodies tainting it.

The best and purest honey is that which is gathered in the first five or six weeks: and in boxes of less dimensions you may take, in a month or little more, provided the season be favourable, a box full of the finest honey.

The top of the box should be made of an entire board a full inch thick after it has been planed; and it should project on all sides at least an inch beyond the dimensions of the box. In the middle of this top there must be a hole five inches square, for a communication between the boxes; and this hole should be covered with a sliding shutter, of deal or elm, running easily in a groove over the back window. The eight pannels, nine inches deep, and three quarters of an inch thick when planed, are to be let into the top so far as to keep them in their proper places; to be secured at the corners with plates of brass, and to be cramped with wires at the bottom to keep them firm; for the heat in summer will try their strength. There should be a glass-window behind, fixed in a frame, with a thin deal-cover, two small brass hinges, and a button to fasten it. This window will be sufficient for inspecting the progress of the bees. Two brass handles, one on each

Bee.

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Mr Thorley's observations, &c.

Fig. 2.

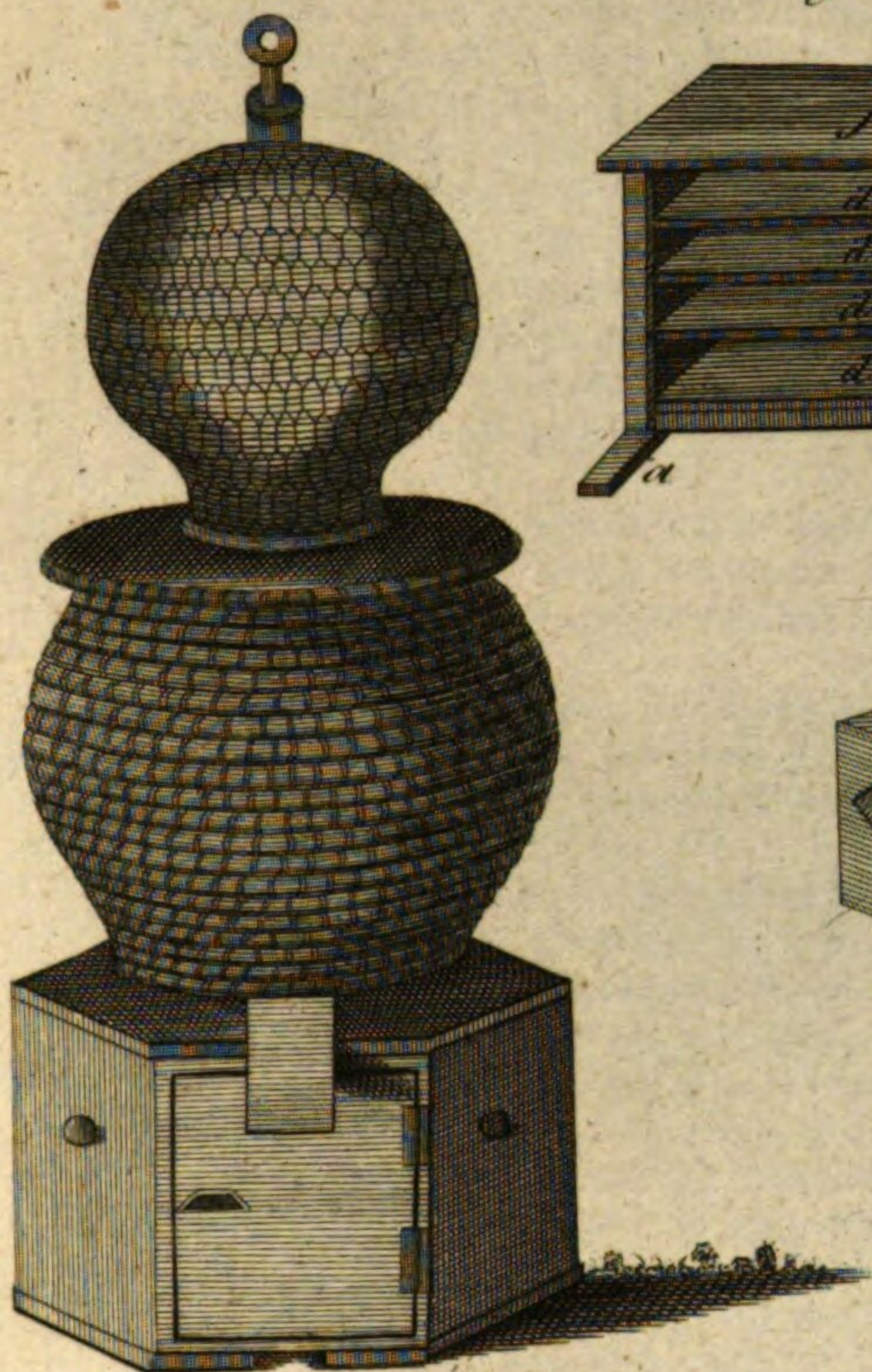


Fig. 5.

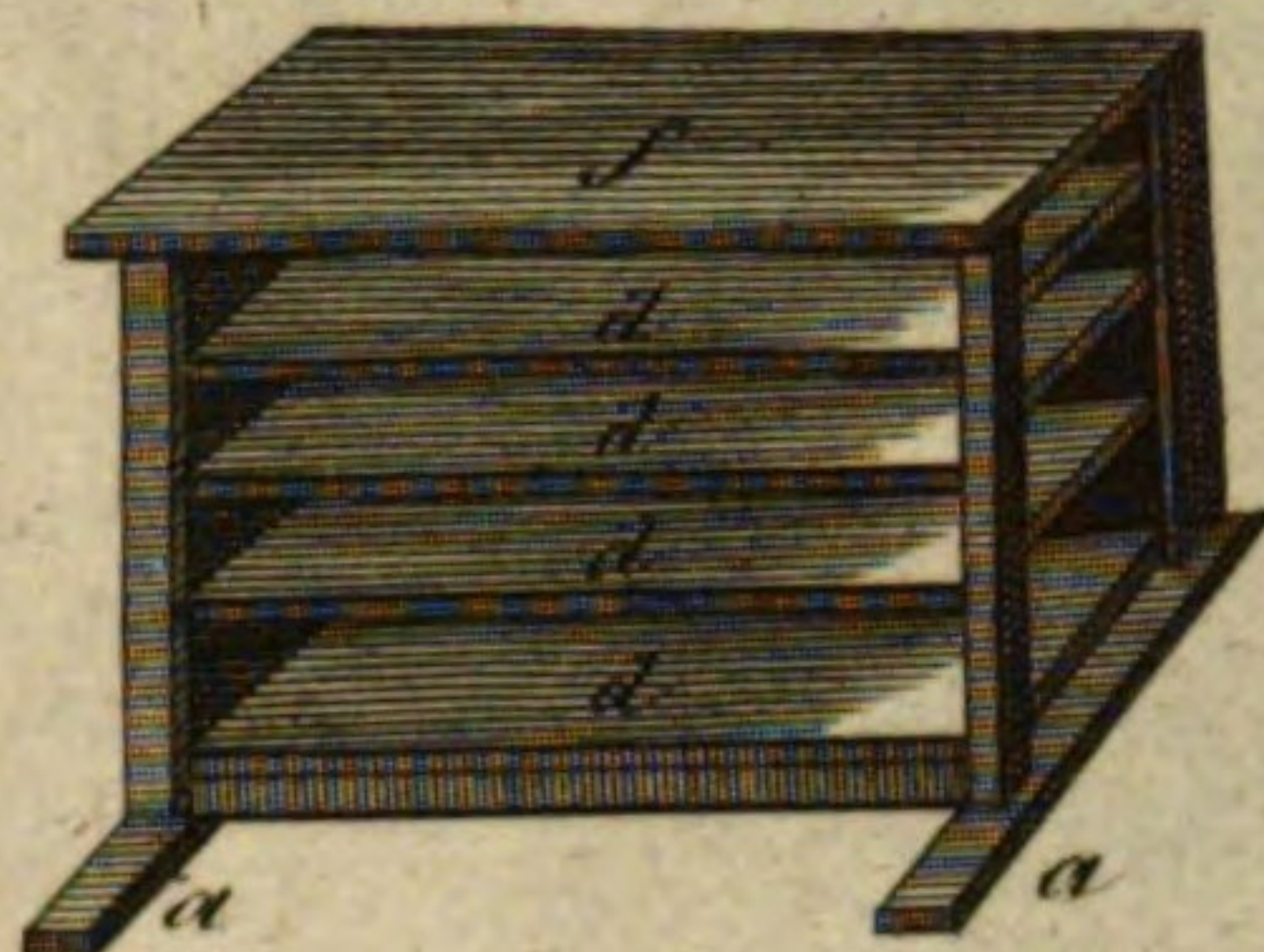


Fig. 4.

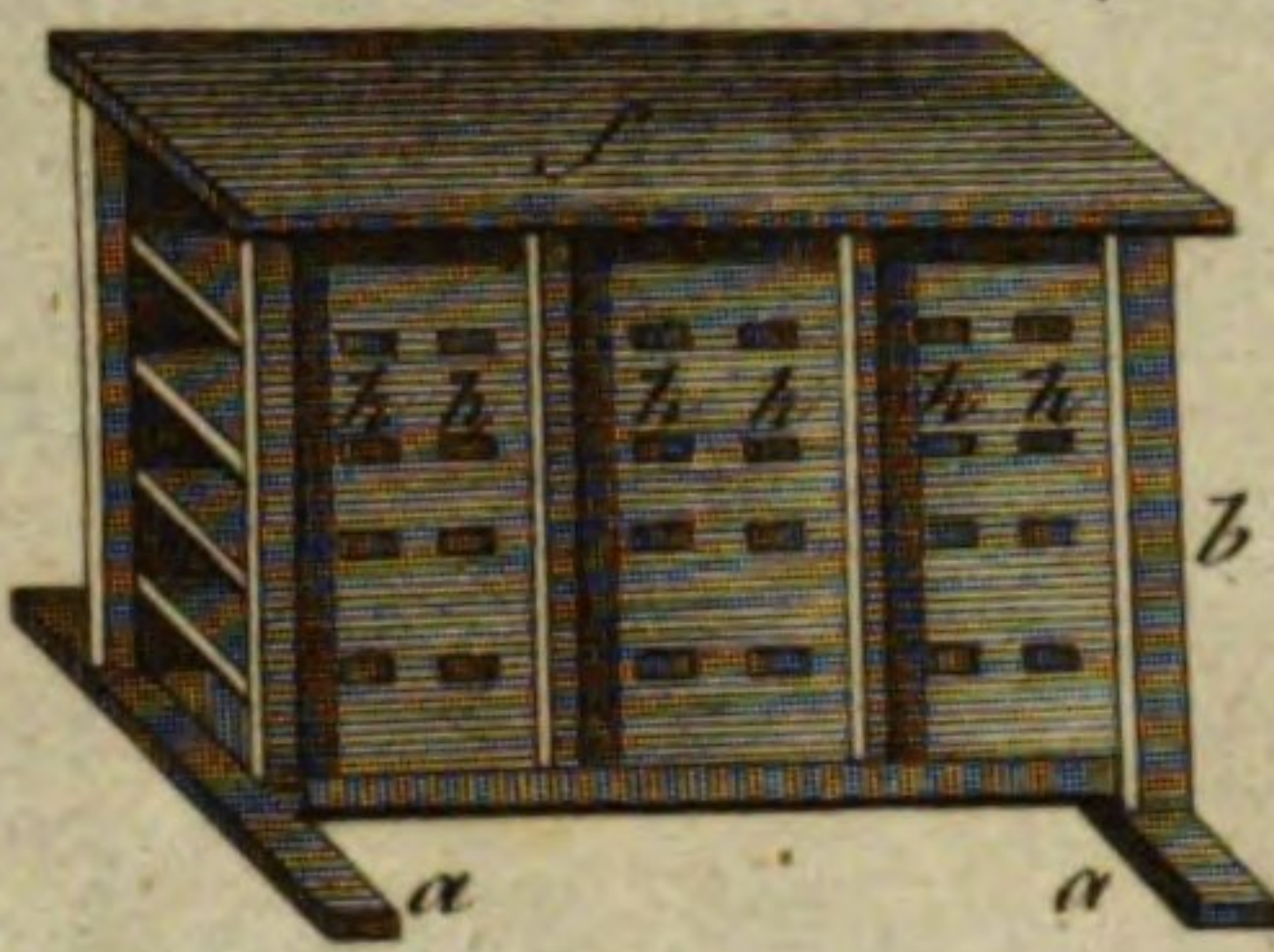


Fig. 1.

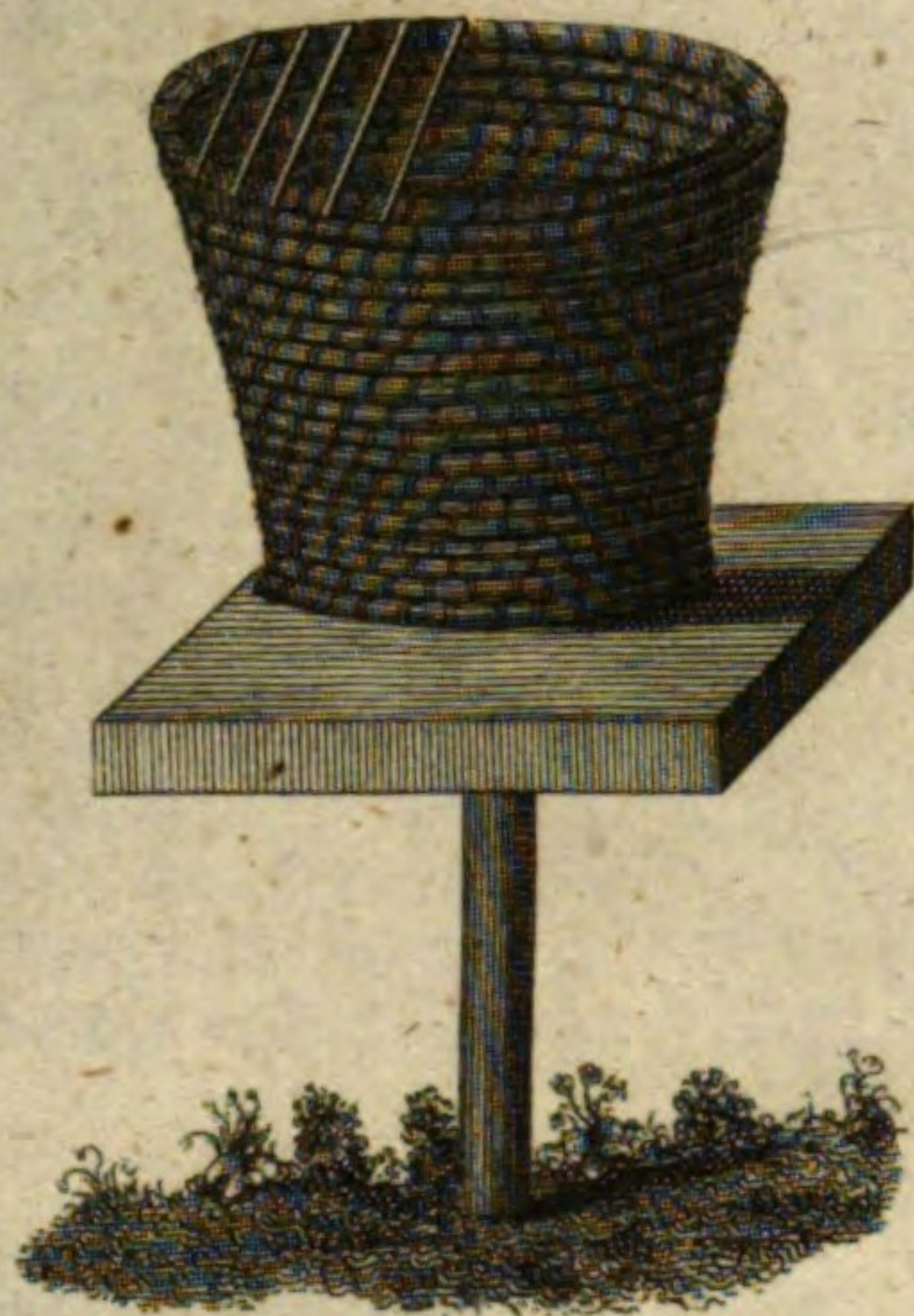


Fig. 3.

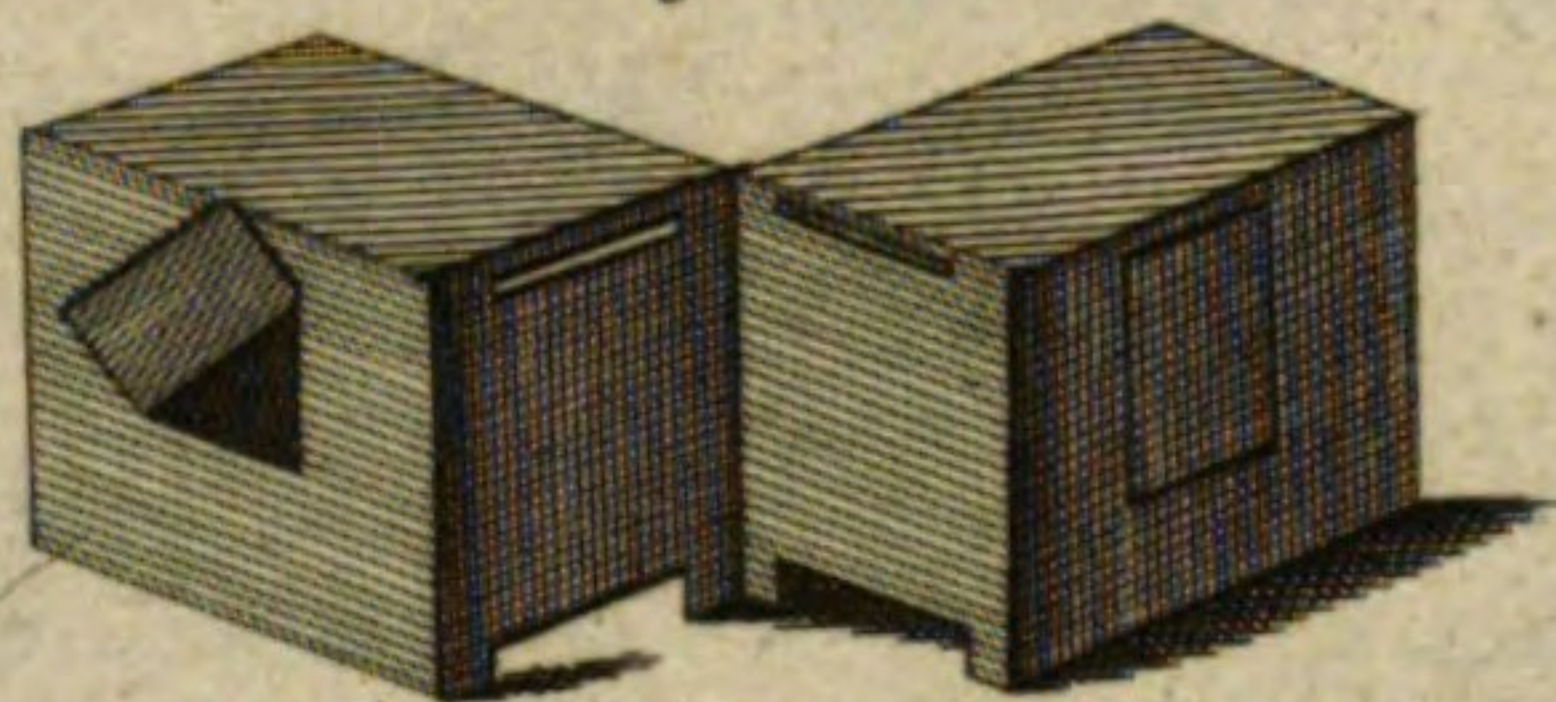


Fig. 6.
Balista.

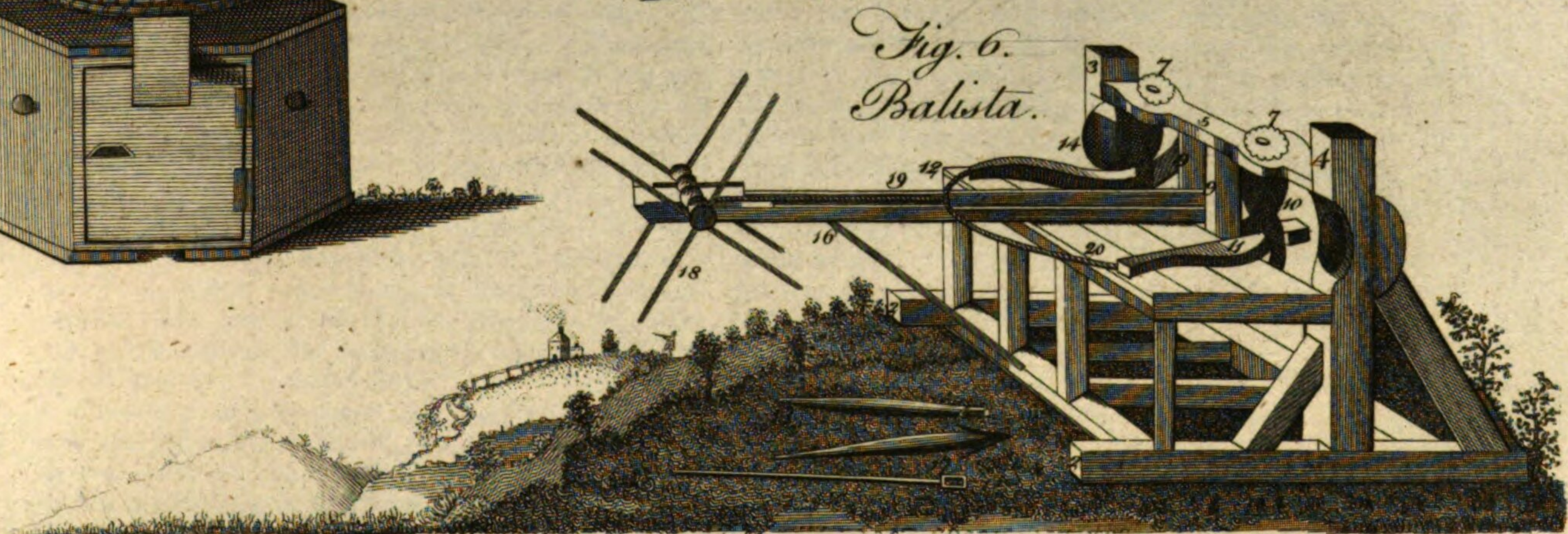


Fig. 7.

Bird Catching.

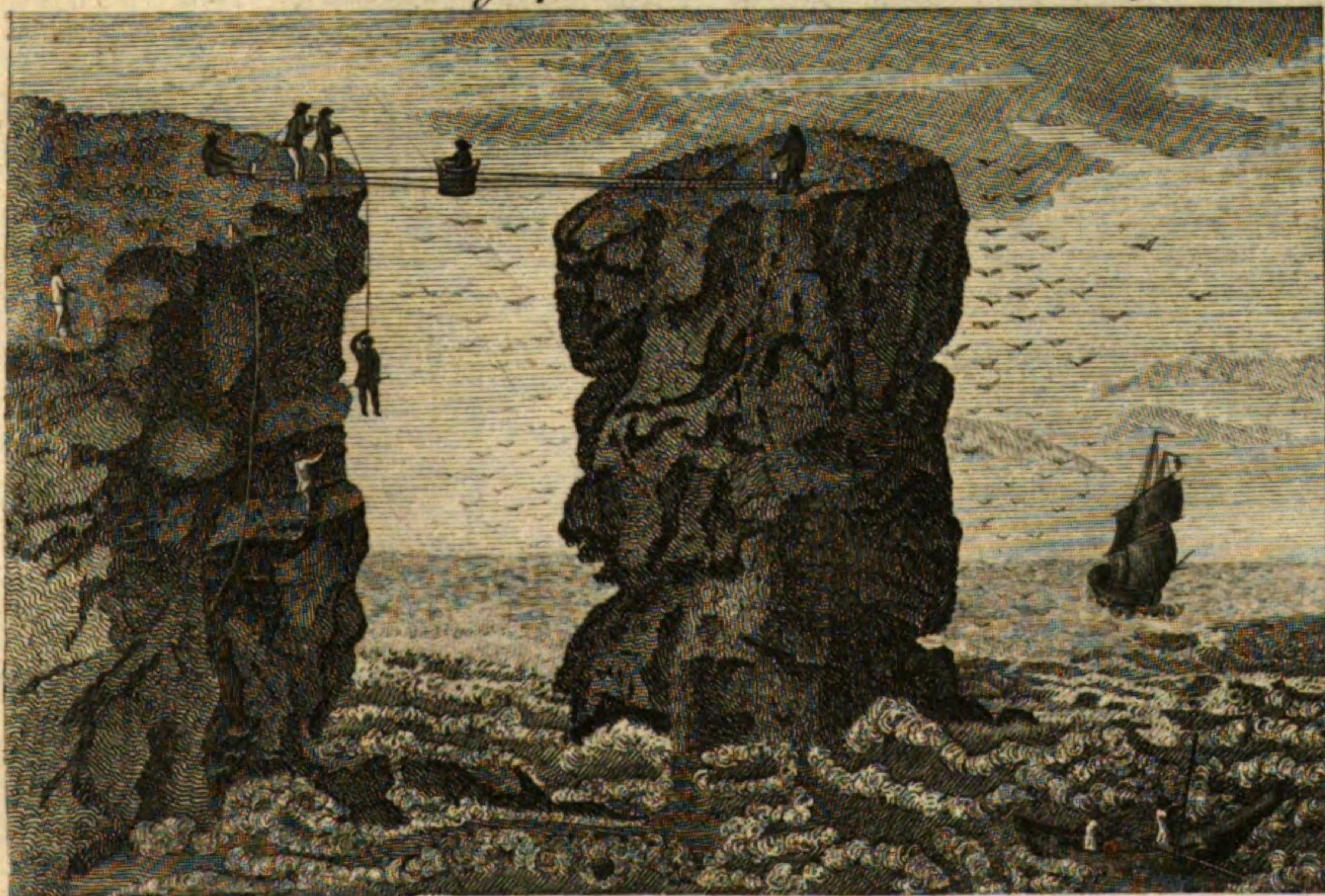


Fig. 8.



Bee.

each side, are necessary to lift up the box: these should be fixed in with two thin plates of iron, near three inches long, so as to turn up and down, and put three inches below the top-board, which is nailed close down with sprigs to the other parts of the box.

Those who choose a frame within, to which the bees may fasten their combs, need only use a couple of deal sticks of an inch square, placed across the box, and supported by two pins of brass; one an inch and half below the top, and the other two inches below it; by which means the combs will quickly find a rest. One thing more, which perfects the work, is, a passage, four or five inches long, and less than half an inch deep, for the bees to go in and out at the bottom of the box.

33
Manage-
ment of
bees in co-
lonies, and
method of
taking their
honey and
wax.

1. In keeping bees in colonies, an house is necessary, or at least a shade; without which the weather, especially the heat of the sun, would soon rend the boxes to pieces.

Your house may be made of any boards you please, but deal is the best. Of whatever sort the materials are, the house must be painted, to secure it from the weather.

The length of this house, we will suppose for six colonies, should be full 12 feet and an half, and each colony should stand a foot distance from the other. It should be three feet and an half high, to admit four boxes one upon another; but if only three boxes are employed, two feet eight inches will be sufficient. Its breadth in the inside should be two feet. The four corner-posts should be made of oak, and well fixed in the ground, that no stormy winds may overturn it; and all the rails should be of oak, supported by several uprights of the same, before and behind, that they may not yield or sink under 6, 7, or 800 weight, or upwards. The floor of the house (about two feet from the ground) should be strong and smooth, that the lowest box may stand close to it.

This floor may be made with boards or planks of deal the full length of the bee-house; or, which is preferable, with a board or plank to each colony, of two feet four inches long, and fixed down to the rails; and that part which appears at the front of the house may be cut into a semicircle, as a proper alighting place for the bees. Plane it to a slope, that the wet may fall off. When this floor to a single colony wants to be repaired, it may easily be removed, and another be placed in its room, without disturbing the other colonies, or touching any other part of the floor.

Upon this floor, at equal distances, all your colonies must be placed, against a door or passage cut in the front of the house.

Only observe farther, to prevent any false step, that as the top-board of the box (being a full inch broader than the other part) will not permit the two mouths to come together, you must cut a third in a piece of deal of a sufficient breadth, and place it between the other two, so close that not a bee may get that way into the house. And fixing the said piece of deal down to the floor with two lath-nails, you will find afterwards to be of service, when you have occasion either to raise a colony, or take a box of honey, and may prove a means of preventing a great deal of trouble and mischief.

The house being in this forwardness, you may cover

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it to your own mind, with boards, fine slates, or tiles. But contrive their position so as to carry off the wet, and keep out the cold, rain, snow, or whatever might any way hurt and prejudice them.

The back-doors may be made of half-inch deal, two of them to shut close in a rabbet, cut in an upright pillar, which may be so contrived as to take in and out, by a mortise in the bottom rail, and a notch in the inside of the upper rail, and fastened with a strong hasp. Place these pillars in the spaces between the colonies.

Concluding your house made after this model, without front doors, a weather-board will be very necessary to carry the water off from the places where the bees settle and rest.

Good painting will be a great preservative. Forget not to paint the mouths of your colonies with different colours, as red, white, blue, yellow, &c. in form of a half-moon, or square, that the bees may the better know their own home. Such diversity will be a direction to them.

Thus your bees are kept warm in the coldest winter; and in the hottest summer greatly refreshed by the cool air, the back-doors being set open without any air-holes made in the boxes.

Dr Warden observes, that in June, July, and August, when the colonies come to be very full, and the weather proves very hot, the appearance of a shower drives the bees home in such crowds, that pressing to get in, they stop the passage so close, that those within are almost suffocated for want of air; which makes these last so uneasy, that they are like mad things. In this extremity, he has lifted the whole colony up a little on one side; and by thus giving them air, has soon quieted them. He has known them, he says, come pouring out, on such an occasion, in number sufficient to have filled at once two or three quarts; as if they had been going to swarm. To prevent this inconvenience, he advises cutting a hole two inches square in about the middle of one of the hinder pannels of each box. Over this hole, nail, in the inside of the box, a piece of tin-plate punched full of holes so small that a bee cannot creep through them; and have over it, on the outside, a very thin slider, made to run in grooves; so that, when it is thrust home, all may be close and warm; and when it is opened, in very hot weather, the air may pass through the holes, and prevent the suffocating heat. Or holes may be bored in the pannels themselves, on such an emergency, in a colony already settled.

Such a thorough passage for the air may be convenient in extreme heat, which is sometimes so great as to make the honey run out of the combs. The Memoirs of the truly laudable Berne Society, for the year 1764, give us a particular instance of this, when they say, that, in 1761, many in Swisserland were obliged to smother their bees, when they saw the honey and wax trickling down; not knowing any other remedy for the losses they daily sustained. Some shaded their hives from the sun, or covered them with clothes wet several times a-day, and watered the ground all around.

The best time to plant the colonies is, either in spring with new flocks full of bees, or in summer with swarms. If swarms are used, procure if possible two of the same day: hive them either in two boxes or in

Bee.

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Bee.

a hive and a box: at night, place them in the bee-house, one over the other; and with a knife and a little lime and hair, stop close the mouth of the hive or upper box, so that not a bee may be able to go in or out but at the front-door. This done, you will in a week or ten days with pleasure see the combs appear in the boxes; but if it be an hive, nothing can be seen till the bees have wrought down into the box. Never plant a colony with a single swarm, as Mr Thorley says he has sometimes done, but with little success.

When the second box, or the box under the hive, appears full of bees and combs, it is time to raise your colony. This should be done in the dusk of the evening, and in the following manner.

Place your empty box, with the sliding shutter drawn back, behind the house, near the colony that is to be raised, and at nearly the height of the floor: then lifting up the colony with what expedition you can, let the empty box be put in the place where it is to stand, and the colony upon it; and shut up the mouth of the then upper box with lime and hair, as before directed.

When, by the help of the windows in the back of the boxes, you find the middle box full of combs, and a quantity of honey sealed up in it, the lowest box half full of combs, and few bees in the uppermost box, proceed thus.

About five o'clock in the afternoon, drive close with a mallet the sliding shutter under the hive or box that is to be taken from the colony. If the combs are new, the shutter may be forced home without a mallet; but be sure it be close, that no bees may ascend into the hive or box to be removed. After this, shut close the doors of your house, and leave the bees thus cut off from the rest of their companions for the space of half an hour or more. In this space of time, having lost their queen, they will fill themselves with honey, and be impatient to be set at liberty.

If, in this interval, you examine the box or boxes beneath, and observe all to be quiet in them, you may be confident that the queen is there, and in safety. Hereupon raise the back part of the hive or box so far, by a piece of wood slipped under it, as to give the prisoners room to come out, and they will return to their fellows: then lifting the box from off the colony, and turning its bottom upmost, cover it with a cloth all night; and the next morning, when this cloth is removed, the bees that have remained in it will return to the colony. Thus you have a hive or box of honey, and all your bees safe.

If the bees do not all come out in this manner, Dr Warder's method may be followed, especially if it be with a hive. It is to place the hive with the small end downward in a pail, peck, or flower-pot, so as to make it stand firm; then to take an empty hive, and set it upon the former, and to draw a cloth tight round the joining of the two hives, so that none of the bees may be able to get out: after this, to strike the full hive so smartly as to disturb the bees that are in it, but with such pauses between the strokes as to allow them time to ascend into the empty hive, which must be held fast whilst this is doing, lest it fall off by the shaking of the other. When you perceive by the noise of the bees in the upper hive, that they are got into this last, carry it to a cloth spread for this purpose before the

colony, with one end fastened to the landing-place, and knock them out upon it: they will soon crawl up the cloth, and join their fellows, who will gladly receive them.

Mr Thorley next gives an account of his narcotic, and of the manner of using it.

The method which he has pursued with great success for many years, and which he recommends to the public as the most effectual for preserving bees in common hives, is incorporation, or uniting two flocks into one, by the help of a peculiar fume or opiate, which will put them entirely in your power for a time to divide and dispose of at pleasure. But as that dominion over them will be of short duration, you must be expeditious in this business.

The queen is immediately to be searched for, and killed. Hives which have swarmed twice, and are consequently reduced in their numbers, are the fittest to be joined together, as this will greatly strengthen and improve them. If a hive which you would take is both rich in honey and full of bees, it is but dividing the bees into two parts, and putting them into two boxes instead of one. Examine whether the flock to which you intend to join the bees of another, have honey enough in it to maintain the bees of both: it should weigh full 20 pounds.

The narcotic, or stupifying fume, is made with the *fungus maximus* or *pulverulentus*, the large mushroom, commonly known by the name of *bunt*, *puckst*, or *frogcheese*. It is as big as a man's head, or bigger: when ripe; it is of a brown colour, turns to powder, and is exceeding light. Put one of these pucks into a large paper, press it therein to two-thirds or near half the bulk of its former size, and tie it up very close: then put it into an oven some time after the household bread has been drawn, and let it remain there all night: when it is dry enough to hold fire, it is fit for use. The manner of using it is thus:

Cut off a piece of the puck, as large as a hen's egg, and fix it in the end of a small stick slit for that purpose, and sharpened at the other end; which place so that the puck may hang near the middle of an empty hive. This hive must be set with the mouth upward, in a pail or bucket which should hold it steady, near the flock you intend to take. This done, set fire to the puck, and immediately place the flock of bees over it, tying a cloth round the hives, that no smoke may come forth. In a minute's time, or little more, you will hear the bees fall like drops of hail into the empty hive. You may then beat the top of the full hive gently with your hand, to get out as many of them as you can: after this, loosing the cloth, lift the hive off to a table, knock it several times against the table, several more bees will tumble out, and perhaps the queen among them. She often is one of the last that falls. If she is not there, search for her among the main body in the empty hive, spreading them for this purpose on a table.

You must proceed in the same manner with the other hive, with the bees of which these are to be united. One of the queens being secured, you must put the bees of both hives together, mingle them thoroughly, and drop them among the combs of the hive which they are intended to inhabit. When they are all in, cover it with a packing or other coarse cloth which will admit

Bee.

Bee.

admit air, and let them remain shut up all that night and the next day. You will soon be sensible that they are awaked from this sleep.

The second night after their union, in the dusk of the evening, gently remove the cloth from off the mouth of the hive (taking care of yourself), and the bees will immediately sally forth with a great noise; but being too late, they will soon return: then inserting two pieces of tobacco-pipes to let in air, keep them confined for three or four days, after which the door may be left open.

The best time for uniting bees is, after their young brood are all out, and before they begin to lodge in the empty cells. As to the hour of the day, he advises young practitioners to do it early in the afternoon, in order that having the longer light, they may the more easily find out the queen. He never knew such combined stocks conquered by robbers. They will either swarm in the next summer, or yield an hive full of honey.

34
Glas-hives.

Mr N. Thornley, son of the above mentioned clergyman, has added to the edition which he has given of his father's book, a postscript, purporting, that persons who choose to keep bees in glass-hives may, after uncovering the hole at the top of a flat-topped straw-hive, or box, place the glass over it so close that no bee can go in or out but at the bottom of the hive or box. The glass-hive must be covered with an empty hive or with a cloth, that too much light may not prevent the bees from working. As soon as they have filled the straw-hive or box, they will begin to work up into the glass-hive. He tells us, that he himself has had one of these glass-hives filled by the bees in 30 days in a fine season; and that it contained 38 pounds of fine honey. When the glass is completely filled, slide a tin-plate between it and the hive or box, so as to cover the passage, and in half an hour the glass may be taken off with safety. What few bees remain in it, will readily go to their companions. He has added a glass window to his straw-hives, in order to see what progress bees make; which is of some importance, especially if one hive is to be taken away whilst the season still continues favourable for their collecting of honey: for when the combs are filled with honey, the cells are sealed up, and the bees forsake them, and reside mostly in the hive in which their works are chiefly carried on. Observing also that the bees were apt to extend their combs through the passage of communication in the upper hive, whether glass or other, which rendered it necessary to divide the comb when the upper hive was taken away, he now puts in that passage a wire screen or netting, the meshes of which are large enough for a loaded bee to go easily through them. This prevents the joining of the combs from one box to the other, and consequently obviates the necessity of cutting them, and of spilling some of the honey, which running down among a crowd of bees, used before to incommode them much, it being difficult for them to clear their wings of it. Fig. 2. is a drawing of one of his colonies.

Pl. XCVII.

35
Of bees in
boxes, and
method of
taking their
honey and
wax.

2. The reverend Mr White informs us, that his fondness for these little animals soon put him upon endeavouring if possible to save them from fire and brimstone; that he thought he had reason to be content to share their labours for the present, and great reason to

Bee.

rejoice if he could at any time preserve their lives, to work for him another year; and that the main drift of his observations and experiments has therefore been, to discover an easy and cheap method, suited to the abilities of the common people, of taking away so much honey as can be spared, without destroying or starving the bees; and by the same means to encourage seasonable swarms.

In his directions how to make the bee-boxes of his inventing, he tells us, speaking of the manner of constructing a single one, that it may be made of deal or any other well-seasoned boards which are not apt to warp or split. The boards should be near an inch thick; the figure of the box square, and its height and breadth nine inches and five eighths, every way measuring within. With these dimensions it will contain near a peck and an half. The front-part must have a door cut in the middle of the bottom edge, three inches wide, and near half an inch in height, which will give free liberty to the bees to pass through, yet not be large enough for their enemy the mouse to enter. In the back-part you must cut a hole with a rabbet in it, in which you are to fix a pane of the clearest and best crown-glass, about five inches in length and three in breadth, and fasten it with putty: let the top of the glass be placed as high as the roof within-side, that you may see the upper part of the combs, where the bees with their riches are mostly placed. You will by this means be better able to judge of their state and strength, than if your glass was fixed in the middle. The glass must be covered with a thin piece of board, by way of shutter, which may be made to hang by a string, or turn upon a nail, or slide sideways between two mouldings. Such as are desirous of seeing more of the bees works, may make the glass as large as the box will admit without weakening it too much; or they may add a pane of glass on the top, which must likewise be covered with a shutter, fastened down with pegs, to prevent accidents.

The side of the box which is to be joined to another box of the same form and dimensions, as it will not be exposed to the internal air, may be made of a piece of slit deal not half an inch thick. This he calls the *side of communication*, because it is not to be wholly inclosed: a space is to be left at the bottom the whole breadth of the box, and a little more than an inch in height; and a hole or passage is to be made at top, three inches long, and more than half an inch wide. Through these the bees are to have a communication from one box to the other. The lower communication being on the floor, our labourers, with their burdens, may readily and easily ascend into either of the boxes. The upper communication is only intended as a passage between the boxes, resembling the little holes or narrow passes which may be observed in the combs formed by our sagacious architects, to save time and shorten the way when they have occasion to pass from one comb to another; just as in populous cities, there are narrow lanes and alleys passing transversely from one large street to another.

In the next place you are to provide a loose board, half an inch thick, and large enough to cover the side where you have made the communications. You are likewise to have in readiness several little iron staples,

Bee.

an inch and half long, with the two points or ends bended down more than half an inch. The use of these will be seen presently.

You have now only to fix two sticks crossing the box from side to side, and crossing each other, to be a stay to the combs; one about three inches from the bottom, the other the same distance from the top; and when you have painted the whole, to make it more durable, your box is finished.

The judicious bee-master will here observe, that the form of the box now described is as plain as possible for it to be. It is little more than five square pieces of board nailed together; so that a poor cottager who has but ingenuity enough to saw a board into the given dimensions, and to drive a nail, may make his own boxes well enough, without the help or expence of a carpenter.

No directions are necessary for making the other box, which must be of the same form and dimensions. The two boxes differ from each other only in this, that the side of communication of the one must be on your right hand; of the other, on your left. Fig. 3. represents two of these boxes, with their openings of communication, ready to join to each other.

Mr White's manner of hiving a swarm into one or both of these boxes is thus:

You are to take the loose board, and fasten it to one of the boxes, so as to stop the communications. This may be done by three of the staples before mentioned; one on the top of the box near the front; the two others on the back, near the top and near the bottom. Let one end of the staple be thrust into a gimlet-hole made in the box, so that the other end may go as tight as can be over the loose board, to keep it from slipping when it is handled. The next morning, after the bees have been hived in this box, the other box should be added, and the loose board should be taken away. This will prevent a great deal of labour to the bees, and some to the proprietor.

Be careful to fasten the shutter so close to the glass, that no light may enter through it; for the bees seem to look upon such light as a hole or breach in their house, and on that account may not so well like their new habitation. But the principal thing to be observed at this time is, to cover the box as soon as the bees are hived with a linen cloth thrown closely over it, or with green boughs to protect it from the piercing heat of the sun. Boxes will admit the heat much sooner than straw-hives; and if the bees find their house too hot for them, they will be wise enough to leave it. If the swarm be larger than usual, instead of fastening the loose board to one box, you may join two boxes together with three staples, leaving the communication open from one to the other, and then hive your bees into both. In all other respects, they are to be hived in boxes after the same manner as in common hives.

The door of the second box should be carefully stopped up, and be kept constantly closed, in order that the bees may not have an entrance but through the first box.

When the boxes are set in the places where they are to remain, they must be screened from the summer's sun, because the wood will otherwise be heated to a greater degree than either the bees or their works can bear; and they should likewise be screened from the

winter's sun, because the warmth of this will draw the bees from that lethargic state which is natural to them, as well as many other insects in the winter-season. For this purpose, and also to shelter the boxes from rain, our ingenious clergyman has contrived the following frame.

Fig. 4. represents the front of a frame for twelve colonies, *a, a*, are two cells of oak lying flat on the ground, more than four feet long. In these cells are fixed four oaken posts, about the thickness of such as are used for drying linen. The two posts *b, b*, in the front, are about six feet two inches above the cells: the other two, standing backward, five feet eight inches. You are next to nail some boards of slit deal horizontally from one of the fore-posts to the other, to screen the bees from the sun. Let these boards be seven feet seven inches in length, and nailed to the inside of the posts; and be well seasoned that they may not shrink or gape in the joints. *c, c*, Are two splints of deal, to keep the boards even, and strengthen them.

Fig. 5. represents the back of the frame. *d, d, d, d*, Are four strong boards of the same length with the frame, on which you are to place the boxes. Let the upper side of them be very smooth and even, that the boxes may stand true upon them: or it may be still more advisable, to place under every pair of boxes a smooth thin board, as long as the boxes, and about a quarter of an inch wider. The bees will soon fasten the boxes to this board in such a manner that you may move or weigh the boxes and board together, without breaking the wax or resin, which for many reasons ought to be avoided. These floors must be supported by pieces of wood or bearers, which are nailed from post to post at each end. They are likewise to be well nailed to the frame, to keep them from sinking with the weight of the boxes. *f* Represents the roof, which projects backward about seven or eight inches beyond the boxes, to shelter them from rain. You have now only to cut niches or holes in the frame, over against each mouth or entrance into the boxes, at *b, b, b*, in fig. 4. Let these niches be near four inches long; and under each you must nail a small piece of wood for the bees to alight upon. The morning or evening sun will shine upon one or both ends of the frame, let its aspect be what it will: but you may prevent its over-heating the boxes, by a loose board set up between the posts, and kept in by two or three pegs.

The same gentleman, with great humanity, observes, that no true lover of bees ever lighted the fatal match without much concern; and that it is evidently more to our advantage, to spare the lives of our bees, and be content with part of their stores, than to kill and take possession of the whole.

About the latter end of August, says he, by a little inspection through your glasses, you may easily discover which of your colonies you may lay under contribution. Such as have filled a box and an half with their works, will pretty readily yield you the half box. But you are not to depend upon the quantity of combs without examining how they are stored with honey. The bees should, according to him, have eight or nine pounds left them, by way of wages for their summer's work.

The most proper time for this business is the middle of the day; and as you stand behind the frame, you will

Bee.

Bee.

will need no armour, except a pair of gloves. The operation itself is very simple, and easily performed, thus: Open the mouth of the box you intend to take; then with a thin knife cut through the resin with which the bees have joined the boxes to each other, till you find that you have separated them; and after this, thrust a sheet of tin gently in between the boxes. The communication being hereby stopped, the bees in the fullest box, where it is most likely the queen is, will be a little disturbed at the operation; but those in the other box where we suppose the queen is not, will run to and fro in the utmost hurry and confusion, and send forth a mournful cry, easily distinguished from their other notes. They will issue out at the newly opened door; not in a body as when they swarm, nor with such calm and cheerful activity as when they go forth to their labours; but by one or two at a time, with a wild flutter and visible rage and disorder. This, however, is soon over: for as soon as they get abroad and spy their fellows, they fly to them instantly and join them at the mouth of the other box. By this means, in an hour or two, for they go out slowly, you will have a box of pure honey, without leaving a bee in it to molest you; and likewise without dead bees, which, when you burn them, are often mixed with your honey, and both waste and damage it.

Mr White acknowledges, that he has sometimes found this method fail, when the mouth of the box to be taken away has not been constantly and carefully closed: the bees will in this case get acquainted with it as an entrance; and when you open the mouth in order to their leaving this box, many of them will be apt to return, and the communication being stopped, will in a short time carry away all the honey from this to the other box; so much do they abhor a separation. When this happens, he has recourse to the following expedient, which he thinks infallible. He takes a piece of deal, a little larger than will cover the mouth of the box, and cuts in it a square niche somewhat more than half an inch wide. In this niche he hangs a little trap-door, made of a thin piece of tin, turning upon a pin, with another pin crossing the niche a little lower so as to prevent the hanging door from opening both ways. This being placed close to the mouth, the bees which want to get out will easily thrust open the door outwards, but cannot open it the other way to get in again; so must, and will readily, make to the other box, leaving this in about the space of two hours, with all its store, justly due to the tender-hearted bee-master as a ransom for their lives.

What led Mr White to prefer collateral boxes to those before in use, was, to use his own words, his "compassion for the poor bees, who, after traversing the fields, return home weary and heavy laden, and must perhaps deposit their burden up two pair of stairs, or in the garret. The lower room, it is likely, is not yet furnished with stairs: for, as is well known, our little architects lay the foundation of their structures at the top, and build downward. In this case, the weary little labourer is to drag her load up the sides of the walls: and when she has done this, she will travel many times backward and forward, as I have frequently seen, along the roof, before she finds the door or passage into the second story; and here again she is perplexed with a like puzzling labyrinth, before she

gets into the third. What a waste is here of that precious time which our bees value so much, and which they employ so well! and what an expence of strength and spirits, on which their support and sustenance depend! In the collateral boxes, the rooms are all on the ground-floor; and because I know my bees are wise enough to value convenience more than state, I have made them of such a moderate, though decent, height, that the bees have much less way to climb to the top of them than they have to the crown of a common hive."

Mr Wildman's hives have been already described (n^o 23, 24.) A good swarm will soon fill one of these hives, and therefore another hive may be put under it the next morning. The larger space allowed the bees will excite their industry in filling them with combs. The queen will lay some eggs in the upper hive; but so soon as the lower hive is filled with combs, she will lay most of them in it. In little more than three weeks, all the eggs laid in the upper hive will be turned into bees; and if the season is favourable, their cells will be soon filled with honey.

As soon as they want room, a third hive should be placed under the two former; and in a few days after the end of three weeks from the time the swarm was put into the hive, the top hive may be taken away at noon of a fair day; and if any bees remain in it, carry it to a little distance from the stand, and turning its bottom up, and striking it on the sides, the bees will be alarmed, take wing, and join their companions in the second and third hives. If it is found that the bees are very unwilling to quit it, it is probable that the queen remains among them. In this case, the bees must be treated in the manner that shall be directed when we describe Mr Wildman's method of taking the honey and the wax. The upper hive now taken away should be put in a cool place, in which no vermin, mice, &c. can come at the combs, or other damage can happen to them, and be thus preserved in reserve.

When the hives seem to be again crowded, and the upper hive is well stored or filled with honey, a fourth hive should be placed under the third, and the upper hive be taken off the next fair day at noon, and treated as already directed. As the honey made during the summer is the best, and as it is needless to keep many full hives in store, the honey may be taken out of the combs of this second hive for use.

If the season is very favourable, the bees may still fill a third hive. In this case, a fifth hive must be put under the fourth, and the third taken away as before. The bees will then fill the fourth for their winter store.

As the honey of the first hive is better than the honey collected so late as that in the third, the honey may be taken out of the combs of the first, and the third may be preserved with the same care as directed for that.

In the month of September, the top hive should be examined: if full, it will be a sufficient provision for the winter; but if light, that is, not containing 20 pounds of honey, the more the better, then, in the month of October, the fifth hive should be taken away, and the hive kept in reserve should be put upon the remaining one, to supply the bees with abundant provisions for the winter. Nor need the owner grudge them this ample store; for they are faithful stewards, and will

Bee.

36
Of the management of bees in Mr Wildman's hives.

Bee.

will be proportionally richer and more forward in the spring and summer, when he will reap an abundant profit. The fifth hive which was taken away should be carefully preserved during the winter, that it may be restored to the same stock of bees, when an additional hive is wanted next summer; or the first swarm that comes off may be put into it. The combs in it, if kept free from filth and vermin, will save much labour, and they will at once go to the collecting of honey.

It is almost needless to observe, that when the hives are changed, a cover, as already directed (see n^o 23.) should be put upon every upper hive; and that when a lower hive becomes an upper hive, the door of it should be shut up, that so their only passage out shall be by the lower hive; for otherwise the queen would be apt to lay eggs in both indiscriminately. The whole of the above detail of the management of one hive may be extended to any number: it may be proper to keep a register to each set; because, in restoring hives to the bees, they may be better pleased at receiving their own labours than that of other stocks.

If in the autumn the owner has some weak hives, which have neither provision nor numbers sufficient for the winter, it is advisable to join the bees to richer hives: for the greater number of bees will be a mutual advantage to one another during the winter, and accelerate their labours much in the spring. For this purpose, carry a poor and a richer hive into a room, a little before night: then force the bees out of both hives into two separate empty hives, in a manner that shall be hereafter directed: shake upon a cloth the bees out of the hive which contains the fewest; search for the queen; and as soon as you have secured her with a sufficient retinue, bring the other hive which contains the greater number, and place it on the cloth on which the other bees are, with a support under one side, and with a spoon shovel the bees under it. They will soon ascend; and, while under this impression of fear, will unite peaceably with the other bees; whereas, had they been added to the bees of the richer hive, while in possession of their castle, many of the new-comers must have paid with their lives for their intrusion.

It appears from the account of the management of bees in Mr Wildman's hives, that there is very little art wanting to cause the bees to quit the hives which are taken away, unless a queen happens by chance to be among them. In that case, the same means may be used as are necessary when we would rob one of the common hives of part of their wealth. The method is as follows:

37
His method
of taking
the honey
and wax.

Remove the hive from which you would take the wax and honey into a room, into which admit but little light, that it may at first appear to the bees as if it was late in the evening. Gently invert the hive, placing it between the frames of a chair or other steady support, and cover it with an empty hive, keeping that side of the empty hive raised a little, which is next the window, to give the bees sufficient light to get up into it. While you hold the empty hive steadily supported on the edge of the full hive, between your side and your left arm, keep striking with the other hand all round the full hive from top to bottom, in the manner of beating a drum, so that the bees may be frightened by the continued noise from all quarters; and they will in consequence mount out of the full hive in-

to the empty one. Repeat the strokes rather quick than strong round the hive, till all the bees are got out of it, which in general will be in about five minutes. It is to be observed, that the fuller the hive is of bees, the sooner they will have left it. As soon as a number of them have got into the empty hive, it should be raised a little from the full one, that the bees may not continue to run from the one to the other, but rather keep ascending upon one another.

So soon as all the bees are out of the full hive, the hive in which the bees are must be placed on the stand from which the other hive was taken, in order to receive the absent bees as they return from the fields.

If this is done early in the season, the operator should examine the royal cells, that any of them that have young in them may be saved, as well as the combs which have young bees in them, which should on no account be touched, though by sparing them a good deal of honey be left behind. Then take out the other combs with a long, broad, and pliable knife, such as the apothecaries make use of. The combs should be cut from the sides and crown as clean as possible, to save the future labour of the bees, who must lick up the honey spilt, and remove every remains of wax; and then the sides of the hive should be scraped with a tablespoon, to clear away what was left by the knife. During the whole of this operation, the hive should be placed inclined to the side from which the combs are taken, that the honey which is spilt may not daub the remaining combs. If some combs were unavoidably taken away, in which there are young bees, the parts of the combs in which they are should be returned into the hive, and secured by sticks in the best manner possible. Place the hive then for some time upright, that any remaining honey may drain out. If the combs are built in a direction opposite to the entrance, or at right angles with it, the combs which are the furthest from the entrance are to be preferred; because there they are best stored with honey, and have the fewest young bees in them.

Having thus finished taking the wax and honey, the next business is to return the bees to their old hive; and for this purpose place a table covered with a clean cloth near the stand, and giving the hive in which the bees are a sudden shake, at the same time striking it pretty forcibly, the bees will be shaken on the cloth. Put their own hive over them immediately, raised a little on one side, that the bees may the more easily enter; and when all are entered, place it on the stand as before. If the hive in which the bees are be turned bottom uppermost, and their own hive be placed over it, the bees will immediately ascend into it, especially if the lower hive is struck on the sides to alarm them.

As the chief object of the bees during the spring and beginning of the summer is the propagation of their kind, honey during that time is not collected in such quantity as it is afterwards: and on this account it is scarcely worth while to rob a hive before the latter end of June; nor is it safe to do it after the middle of July, lest rainy weather may prevent their restoring the combs they have lost, and laying in a stock of honey sufficient for the winter, unless there is a chance of carrying them to a rich pasture.

BEE is also used figuratively to denote sweetness, industry,

Bee.

Beech
||
Beer.

dustry, &c. Thus Xenophon is called the *Attic bee*, on account of the great sweetness of his style. Antonius got the denomination *Melissa* or *Bee*, on account of his collection of common places.—Leo Allatius gave the appellation *apes urbanae* to the illustrious men at Rome from the year 1630 to the year 1632.

BEE's-Bread. See BEE, n° 12. par. ult.

BEE-Eater, in zoology. See MEROPS.

BEE-Flower. See OPHRYS.

BEE-Glue, called by the ancients *propolis*, is a soft, unctuous, glutinous matter, employed by bees to cement the combs to the hives, and to close up the cells. See BEE, n° 13.

BEE-Hives. See BEE, n° 19, 34, 36.

BEECH-TREE, in botany. See FAGUS.

BEECH-Mast, the fruit of the beech-tree, said to be good for fattening hogs, deer, &c.—It has sometimes, even to men, proved an useful substitute for bread. Chios is said to have endured a memorable siege by means of it.

BEECH-Oil, an oil drawn by expression from the mast of the beech-tree, after it has been shelled and pounded. This oil is very common in Picardy, and used there and in other parts of France instead of butter; but most of those who take a great deal of it complain of pains and a heaviness in the stomach.

BEEF, the flesh of black-cattle prepared for food.

† Lect. on According to Dr Cullen †, beef, though of a more
Mat. Med. firm texture and less soluble than mutton, is equally alkaliescent, perspirable, and nutritious: and if in the southern countries it is not esteemed so, it is on account of its imperfection there.

BEELE, a kind of pick-axe, used by the miners for separating the ores from the rocks in which they lie: this instrument is called a *tubber* by the miners of Cornwall.

BEER, is a spirituous liquor made from any farinaceous grain, but generally from barley. It is, properly speaking, the wine of barley. The meals of any of these grains being extracted by a sufficient quantity of water, and remaining at rest in a degree of heat requisite for the spirituous fermentation, naturally undergo this fermentation, and are changed into a vinous liquor. But as all these matters render the water mucilaginous, fermentation proceeds slowly and imperfectly in such liquors. On the other side, if the quantity of farinaceous matter be so diminished that its extract or decoction may have a convenient degree of fluidity, this liquor will be impregnated with so small a quantity of fermentable matter, that the beer or wine of the grain will be too weak, and have too little taste.

These inconveniences are remedied by preliminary operations which the grain is made to undergo.—These preparations consist in steeping it in cold water, that it may soak and swell to a certain degree; and in laying it in a heap with a suitable degree of heat, by means of which, and of the imbibed moisture, a germination begins, which is to be stopped by a quick drying, as soon as the bud shows itself. To accelerate this drying, and render it more complete, the grain is slightly roasted, by making it pass down an inclined canal sufficiently heated. This germination, and this slight roasting, changes considerably the nature of the mucilaginous fermentable matter of the grain. The germi-

nation attenuates much, and in some measure totally destroys, the viscosity of the mucilage; and it does this, when not carried too far, without depriving the grain of any of its disposition to ferment. On the contrary, it changes the grain into a saccharine substance, as may be perceived by mashing grains beginning to germinate. The slight roasting contributes also to attenuate the mucilaginous fermentable matter of the grain. When the grain is thus prepared, it is fit to be ground, and to impregnate water with much of its substance without forming a glue or viscous mass. The grain thus prepared is called *malt*. This malt is then to be ground; and all its substance, which is fermentable and soluble in water, is to be extricated by means of hot water. This extract or infusion is sufficiently evaporated by boiling in caldrons; and some plant of an agreeable bitterness, such as hops, is at that time added, to heighten the taste of the beer, and to render it capable of being longer preserved. Lastly, this liquor is put into casks, and allowed to ferment; nature performs the rest of the work, and is only to be assisted by the other most favourable circumstances for the spirituous fermentation. See FERMENTATION.

Foreigners have framed divers conjectures to account for the excellency of the British beer, and its superiority to that of other countries, even of Bremen, Mons, and Rostoch. It has been pretended our brewers throw dead dogs flea'd into their wort, and boil them till the flesh is all consumed. Others, more equitable, attribute the excellency of our beer to the quality of our malt and water, and the skill of our brewers in preparing it.

Sour beer may be restored divers ways; as by salt made of the ashes of barley-straw, put into the vessel and stirred; or by three or four handfuls of beech-ashes thrown into the vessel, and stirred; or, where the liquor is not very sour, by a little put in a bag, without stirring: chalk calcined, oyster-shells, egg-shells, burnt sea-shells, crabs eyes, alkalized coral, &c. do the same, as they imbibe the acidity, and unite with it into a sweetness.—Beer, it is said, may be kept from turning sour in summer, by hanging into the vessel a bag containing a new-laid egg, pricked full of little pin-holes, some laurel-berries, and a few barley-grains; or by a new-laid egg and walnut-tree leaves. Glauber commends his sal mirabile and fixed nitre, put in a linen bag, and hung on the top of the cask so as to reach the liquor, not only for recovering sour beer, but preserving and strengthening it.

Laurel-berries, their skin being peeled off, will keep beer from *deadness*; and beer already dead may be restored by impregnating it with fixed air.

Beer tasting of the cask may be freed from it by putting a handful of wheat in a bag, and hanging it in the vessel.

BEEROTH, a village of Judea, situated at the foot of Mount Gabaon, seven miles from Ælia or Jerusalem, on the road to Nicopolis (Jerome).

BEER-SHEBA (Moses), a city to the south of the tribe of Juda, adjoining to Idumea (Josephus). See BERSABE.

BEESTINGS, or *BREASTINGS*, a term used by country people for the first milk taken from a cow after calving.—The beestings are of a thick consistence, and yellow colour, seeming impregnated with sulphur,

Beer
||
Beestings.

Beet
||
Beglerbeg.

Dr Morgan imagines them peculiarly fitted and intended by nature to cleanse the young animal from the recrement gathered in its stomach and intestines during its long habitation *in utero*. The like quality and virtue he supposes in womens first milk after delivery; and hence infers the necessity of the mother's sucking her own child, rather than committing it to a nurse whose first milk is gone.

BEET, in botany. See BETA.

BEETLE, in the history of insects. See SCARABÆUS.

BEETLE also denotes a wooden instrument for driving piles, &c. It is likewise called a *flamper*, and by paviors a *rammer*.

BEEVES, a general name for oxen. See BOS.

BEFORT, a small but strong town of France, and capital of Suntgaw in Alsace. It was ceded to France by the treaty of Westphalia in 1648. There are not above 100 houses in this town, but it is important on account of the great road by this place from Franche Compté. The fortifications were greatly augmented by Louis XIV. It is seated at the foot of a mountain. E. Long. 6. 2. N. Lat. 47. 38.

BEG, or BEY, in the Turkish affairs. See BEY.

Beg is more particularly applied to the lord of a banner, called also in the same language *sangiak-beg*. A beg has the command of a certain number of the spahis, or horse, maintained by the province under the denomination of *timariots*. All the begs of a province obey one governor-general called *begler-beg*, or *beyler-beg*, q. d. lord of lords, or of the beys of the province.

BEGS, or BEGHS, of Egypt, denote twelve generals, who have the command of the militia or standing forces of the kingdom; and are to secure the country from the insults of Arabs, as well as to protect the pilgrims in their annual expeditions to Mecca. The begs, several of whom are descended from the ancient race of the Mamalukes, are very rich and powerful, maintaining each 500 fighting men for their own guard, and the service of their court. On discontents, they have frequently risen in rebellion. They are often at variance with the bashaw, whom they have more than once plundered and imprisoned.

BEGA (Cornelius), painter of landscape, cattle, and conversations, was born at Haerlem in 1620, and was the disciple of Adrian Ostade. Falling into a dissipated way of life, he was disinherited by his father; for which reason he cast off his father's name, which was Begeyn, and assumed that of Bega; his early pictures being marked with the former, and his latter works with the other. He had a fine pencil, and a delicate manner of handling his colours, so as to give them a look of neatness and transparence; and his performances are so much esteemed in the Low Countries as to be placed among the works of the best artists. He took the plague from a woman with whom he was deeply enamoured; and he showed so much sincerity of affection, that, notwithstanding the exhortations of all his friends and physicians, he would attend her to the last moments of her life, and died a few days after, aged 44.

BEGHARDS. See BEGUARDS.

BEGLERBEG, a governor of one of the principal governments in the Turkish empire, and next in dignity

to the grand vizier. To every beglerbeg the grand signior gives three ensigns or staves, trimmed with a horse-tail; to distinguish them from the bashaws, who have but two; and from simple begs, or sangiac begs, who have but one.

The province or government of beglerbeg is called *beglerbeglik*, or *beglierbeglik*. These are of two sorts; the first called *basilo beglerbeglik*, which have a certain rent assigned out of the cities, countries, and signories allotted to the principality; the second called *saliana beglerbeglik*, for maintenance of which is annexed a salary or rent, collected by the grand signior's officers with the treasure of the empire. The beglerbegs of the first sort are in number 22, viz. those of Anatolia, Caramania, Diarbekir, Damascus, Aleppo, Tripoli, Trebizond, Buda, Temiswar, &c. The beglerbegs of the second sort are in number six, viz. those of Cairo, Babylon, &c. Five of the beglerbegs have the title of *viziers*, viz. those of Anatolia, Babylon, Cairo, Romania, and Buda.

The beglerbegs appear with great state, and a large retinue, especially in the camp, being obliged to bring a soldier for every 5000 aspers of rent which they enjoy. Those of Romania brought 10,000 effective men into the field.

The beglerbegs are become almost independent, and have under their jurisdiction several sangiacs or particular governments, and begs, agas, and other officers who obey them.

BEGUARDS, or BEGHARDS, religious of the third order of St Francis in Flanders. They were established at Antwerp in the year 1228, and took St Begghe for their patroness, whence they had their name. From their first institution they employed themselves in making linen cloth, each supporting himself by his own labour, and united only by the bonds of charity, without having any particular rule. But, when Pope Nicholas IV. had confirmed that of the third order of St Francis in 1289, they embraced it the year following. They were greatly favoured by the Dukes of Brabant, particularly John II. and John III. who exempted them from all contributions and taxes. In the year 1425, they began to live in common, and made solemn vows in 1467, after having taken the habit of the Tertiaries (or religious of the third order of St Francis) of Liege. At last, in 1472, they became subject to the general of the congregation of Zepperen in the diocese of Liege, to which they were united by Pope Sixtus IV. As the convent of Antwerp is since become very considerable, the name of *Beguards* has been given to all the other religious of the same congregation. But, in 1650, Pope Innocent X. having suppressed the general of the congregation of Zepperen, all the convents of the third order of St Francis, in the dioceses of Liege, Malines, and Antwerp, were submitted to the visitation, jurisdiction, and correction, of the general of Italy, and erected into a province, under the title of *the province of Flanders*. This province has at present 10 or 12 convents, the principal of which are those of Antwerp, Brussels, Maeltricht, and Louvain.

BEGUINES, a congregation of religious or nuns founded either by St Begghe, founder likewise of the Beguards, or by Lambert le Begue; of whom the former died about the end of the seventh century, the latter

Beguards,
Beguines.

Beguines, latter about the end of the 12th. They were established first at Liege, and afterwards at Neville, in 1207; and from this last settlement sprang the great number of Beguinages, which are spread over all Flanders, and which have passed from Flanders into Germany. In the latter country, some of these religious fell into extravagant errors, persuading themselves that it was possible, in the present life, to arrive at the highest perfection, even to impeccability, and a clear view of God; in short, to so eminent a degree of contemplation, that there was no necessity, after this, either to observe the fasts of the church, or submit to the direction and laws of mortal men. The council of Vienna, in 1113, condemned these errors, and abolished the order of Beguines; permitting, nevertheless, those among them, who continued in the true faith, to live in chastity and penitence, either with or without vows. It is by favour of this latter clause, that there still subsists so many communities of Beguines in Flanders; who, since the council of Vienna, have conducted themselves with so much wisdom and piety, that Pope John XXII. by his decretal, which explains that of his predecessor made in the council of Vienna, took them under his protection; and Boniface VIII. in another, exempted them from the secular tribunal, and put them under the jurisdiction of the bishops.

There is scarce a town in the Low-Countries, in which there is not a society of Beguines; and, notwithstanding the change of religion at Amsterdam, there is a very flourishing one in that city. These societies consist of several houses placed together in one inclosure, with one or more churches, according to the number of Beguines. There is in every house a prioress, or mistress, without whose leave they dare not stir out. They make a sort of vow, which is conceived in the following terms: "I. N. promise to be obedient and chaste as long as I continue in this Beguinage." They observe a three years noviciate before they take the habit. The rector of the parish is superior of the Beguinage; and he does nothing without the advice of eight Beguines. They were formerly habited in different manners; some in grey, others in blue; but at present they all wear black. When they go abroad, in Amsterdam, they put on a black veil. Formerly they had as many different statutes as there were societies. In the visitations of the year 1600 and 1601, by the archbishop Matthias Hovius, they were forbidden, under the penalty of a fine, to have lap-dogs. The finest Beguinage in Flanders is that of Malines. That of Antwerp likewise is very spacious, and has two separate churches.

BEHEADING, a capital punishment, wherein the head is severed from the body by the stroke of an axe, sword, or other cutting instrument.

Beheading was a military punishment among the Romans, known by the name of *decollatio*. Among them the head was laid on a *cippus* or block, placed in a pit dug for the purpose; in the army, without the *vallum*: in the city, without the walls, at a place near the *porta decumana*. Preparatory to the stroke, the criminal was tied to a stake, and whipped with rods. In the early ages the blow was given with an axe; but in after-times with a sword, which was thought the more reputable manner of dying. The execution was but clumsily performed in the first times; but after-

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wards they grew more expert, and took the head off *Behemoth*. clean, with one circular stroke.

In England and France, beheading is the punishment of nobles; being reputed not to derogate from nobility, as hanging does.

In Scotland they do not behead with an axe, as in England; nor with a sword, as in Holland and France; but with an edged instrument called the *MAIDEN*.

BEHEMOTH, the hippopotamus or river-horse. See *HIPPOPOTAMUS*.

BEHEN, in botany. See *CUCUBALUS*.

BEHMEN. See *BOEHMEN*.

BEHN (Aphara), a celebrated authoress, descended from a good family in the city of Canterbury, was born some time in Charles I.'s reign, but in what year is uncertain. Her father's name was *Johnson*, who through the interest of the Lord Willoughby, to whom he was related, being appointed lieutenant-general of Surinam and 36 islands, undertook a journey to the West-Indies, taking with him his whole family, among whom was our poetess, at that time very young. Mr Johnson died in the voyage; but his family reaching Surinam, settled there for some years. Here it was that she learned the history of, and acquired a personal intimacy with, the American prince Oroonoko and his beloved Imoinda, whose adventures she hath so pathetically related in her celebrated novel of that name, and which Mr Southerne afterwards made such an admirable use of in adopting it as the ground-work of one of the best tragedies in the English language.

On her return to London, she became the wife of one Mr Behn, a merchant, residing in that city, but of Dutch extraction. How long he lived after their marriage is not very apparent, probably not very long; for her wit and abilities having brought her into high estimation at court, King Charles II. fixed on her as a proper person to transact some affairs of importance abroad during the course of the Dutch war. To this purpose she went over to Antwerp, where, by her intrigues and gallantries, she so far crept into the secrets of state, as to answer the ends proposed by sending her over. Nay, in the latter end of 1666, she, by means of the influence she had over one Vander Albert, a Dutchman of eminence, whose heart was warmly attached to her, she wormed out of him the design formed by De Ruyter, in conjunction with the family of the De Wits, of sailing up the Thames and burning the English ships in their harbours, which they afterwards put in execution at Rochester. This she immediately communicated to the English court: but though the event proved her intelligence to be well grounded, yet it was at that time only laughed at; which, together probably with no great inclination shown to reward her for the pains she had been at, determined her to drop all further thoughts of political affairs, and during the remainder of her stay at Antwerp to give herself up entirely to the gaiety and gallantries of the place. Vander Albert continued his addresses, and after having made some unsuccessful attempts to obtain the possession of her person on easier terms than matrimony, at length consented to make her his wife; but while he was preparing at Amsterdam for a journey to England with that intent, a fever carried him off, and left her free from any amorous engagements. In her voyage back to England, she was very near being lost, the vessel she was in being driven

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on the coast by a storm; but happening to founder within sight of land, the passengers were, by the timely assistance of boats from the shore, all fortunately preserved.

From this period she devoted her life entirely to pleasure and the muses. Her works are extremely numerous, and all of them have a lively and amorous turn. It is no wonder then that her wit should have gained her the esteem of Mr Dryden, Southerne, and other men of genius, as her beauty, of which in her younger part of life she possessed a great share, did the love of those of gallantry. Nor does she appear to have been any stranger to the delicate sensations of that passion, as appears from some of her letters to a gentleman, with whom she corresponded under the name of Lycida, and who seems not to have returned her flame with equal ardour, or received it with that rapture her charms might well have been expected to command.

She published three volumes of Miscellany Poems; two volumes of Histories and Novels; translated Fontenelle's Plurality of Worlds, and annexed a Criticism on it; and her Plays make four volumes. In the dramatic line, the turn of her genius was chiefly to comedy. As to the character her plays should maintain in the records of dramatic history, it will be difficult to determine, since their faults and perfections stand in strong opposition to each other. In all, even the most indifferent of her pieces, there are strong marks of genius and understanding. Her plots are full of business and ingenuity, and her dialogue sparkles with the dazzling lustre of genuine wit, which every where glitters among it. But then she has been accused, and that not without great justice, of interlarding her comedies with the most indecent scenes, and giving an indulgence in her wit to the most indelicate expressions. To this accusation she has herself made some reply in the Preface to the Lucky Chance; but the retorting the charge of prudery and preciseness on her accusers, is far from being a sufficient exculpation of herself. The best and perhaps the only true excuse that can be made for it is, that, as she wrote for a livelihood, she was obliged to comply with the corrupt taste of the times.

After a life intermingled with numerous disappointments, she departed from this world on the 16th of April 1689, and lies interred in the cloysters of Westminster-Abbey.

BEJA, an ancient town of Portugal, in the province of Alentejo. It is seated in a very agreeable and fruitful plain, remarkable for excellent wine. There are three gates remaining, which are of Roman architecture, and a great many Roman antiquities are dug out of the earth. The town has a strong castle for its defence, and is situated W. Long. 7. 20. N. Lat. 37. 58. It was taken from the Moors in 1162.

BEJAR, a town of Estremadura in Spain, famous for its baths. It is seated in a very agreeable valley surrounded with high mountains whose tops are always covered with snow. Here the dukes of Bejar have an handsome palace. In this neighbourhood are forests filled with game, and watered by fine springs; also a lake abounding with excellent fish, particularly trouts. They pretend that this lake makes such a noise before a storm, that it may be heard 15 miles off.

BEICHLINGEN, a town of Thuringia in Upper Saxony, in E. Long. 11. 50. N. Lat. 51. 20.

BEILA, a town of Italy, in Piedmont. E. Long. 7. 45. N. Lat. 45. 2.

BEILSTEIN, a town of the landgraviate of Hesse in Germany, in E. Long. 8. 0. N. Lat. 50. 30.

BEINASCHI (Giovanni Battista), called *Cavaliere Beinaschi*, history painter, was a Piedmontese, and born in 1634. He studied in Rome, under the direction of Pietro del Po; and some authors affirm, that he was afterwards the disciple of Lanfranc. It was certain that he was peculiarly fond of the works of Lanfranc, and at last became so thoroughly acquainted with the style, manner, and touch, of that excellent master, that many of the pictures of Beinaschi are at this day accounted the work of Lanfranc's own hand. He was an admirable designer; his lively invention furnished him with a surprising variety: his thought was noble; he was not only expeditious but correct; and as a public acknowledgment of his merit, the honour of knighthood was conferred upon him.

BEINHEIM, a fort of Alsace in France, seated on the river Sur, near its confluence with the Rhine, in E. Long. 8. 12. N. Lat. 45. 2.

BEIRA, a province of Portugal, bounded on the west by the ocean, on the south by the Portuguese Estremadura, on the south-east by the Spanish province of the same name, on the east by the province of Trallos Montos, and on the north by the river Douro. It extends in length about 34 leagues, and in breadth about 30 leagues, and is divided into six commarcas. Within this province lies Lamêgo, where the first assembly of the states was held; the chief Episcopal city of Conimbra, or Coimbra, which is likewise an university; and Viseo, also a bishopric, and formerly the capital of a dukedom. The country is equally agreeable and fruitful, producing corn, wines, &c. in abundance, and the hills affording excellent pasture to cattle and sheep. The settled militia consists of about 10,000 men.

BEIRAM, or BAIRAM. See BAIRAM.

BEIRALSTON, a town in Devonshire, which sends two members to parliament.

BEIZA, or BEIZATH, in Hebrew antiquity, a word signifying an egg; as also a certain measure in use among the Jews. The beiza was likewise a gold coin, weighing 40 drachms, among the Persians, who gave out that Philip of Macedon owed their king Darius 1000 beizaths or golden eggs, for tribute-money; and that Alexander the Great refused to pay them, saying, that the bird which laid these eggs was flown into the other world.

BEKKER (Balthasar), one of the most famous Dutch divines, and author of the celebrated book, *The World bewitched*, an ingenious piece against the vulgar notion of spirits. This raised a terrible clamour against him. He was deposed from the office of minister; but the magistrates of Amsterdam continued him his pension. He died in 1698.

BEL (Matthias), was born in Hungary, and became a Lutheran minister at Presburg, and historiographer to the Emperor Charles VI. He wrote, among other works, a History of Hungary, which was so much admired, that the emperor sent him letters of nobility; and notwithstanding his being a Lutheran, the Pope, in 1736, sent him his picture, and many large gold medals. He was a member of the Royal Society of

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of London, and of the academies of Berlin and Petersburg; and died in 1749, at 66 years of age.

BEL, or *Belus*, the supreme god of the ancient Chaldeans or Babylonians. He was the founder of the Babylonian empire; and is supposed to be the Nimrod of Scripture, and the same as the Phœnician Baal. This god had a temple erected to him in the city of Babylon, on the very uppermost range of the famous tower of Babel, or Babylon, wherein were many statues of this deity; and one, among the rest, of massy gold, 40 feet high. The whole furniture of this magnificent temple was of the same metal, and valued at 800 talents of gold.—This temple, with its riches, was in being till the time of Xerxes, who, returning from his unfortunate expedition into Greece, demolished it, and carried off the immense wealth which it contained. It was the statue of this god which Nebuchadnezzar, being returned to Babylon after the end of the Jewish war, set up and dedicated in the plain of Dura; the story of which is related at large in the third chapter of Daniel.

BEL and the Dragon (the history of); an apocryphal, and uncanonical book of Scripture. It was always rejected by the Jewish church, and is extant neither in the Hebrew nor the Chaldee language, nor is there any proof that it ever was so. St Jerom gives it no better title than the *Fable of Bel and the Dragon*. It is however permitted to be read, as well as the other apocryphal writings, for the instruction and improvement of manners.

BELAC, a small city of France, in the province of the Lyonnais, and district of La Marche. E. Long. 1. 15. N. Lat. 46. 15.

BELAY, on board a ship, signifies the same as fasten.—Thus they say, belay the sheet, or tack, that is, fasten it to the keel, by winding it several times round a last, &c.

BELCASTRO, an episcopal city of Italy in the farther Calabria, and kingdom of Naples. It is seated on a mountain, in E. Long. 17. 15. N. Lat. 39. 6.

BELCHITE, a town of Spain, in the kingdom of Arragon, seated on the river Almonazir, in W. Long. 0. 30. N. Lat. 41. 19.

BELCHOE, a town of Ireland, in the province of Ulster, and county of Fermanagh, seated on Lough Nilly, in W. Long. 6. 6. N. Lat. 54. 2.

BELEM, a town of Estremadura in Portugal, about a mile from Lisbon. It is seated on the north side of the river Tajo, and is designed to defend the entrance to Lisbon; and here all the ships that sail up the river must bring to. In this place they inter the kings and queens of Portugal.

BELEMNITES, vulgarly called *thunder-bolts* or *thunder-stones*. They are composed of several crusts of stone encircling each other, of a conical form, and various sizes; usually a little hollow, and somewhat transparent, formed of several stræ radiating from the axis to the surface of the stone; and when burnt or rubbed against one another, or scraped with a knife, yield an odour like rasped horn. Their size is various, from a quarter of an inch to eight inches; and their colour and shape differ. They are supposed to be originally either a part of some sea production; or a stone formed in the cavity of some worm-shell, which being of a tender and brittle nature, has perished, after giving its

form to the stone. They are very frequently found in many parts of England; and the common people have a notion, that they are always to be met with after a storm. They are often inclosed in, or adhere to, other stones; and are most frequent amongst gravel, or in clay: they abound in Gloucestershire; and are found near Dedington in Oxfordshire, where they sometimes contain the silver marcasite.

BELERIUM, (anc. geog.), a promontory of the Dumnonii or Damnonii, the westmost Britons. Now called the *land's end*, in Cornwall.

BELESIS, or NANYBRUS, said to have been the founder of the ancient Babylonish empire, and in conjunction with Arbaces the Mede to have put an end to the kingdom of the Assyrians by the defeat and death of Sardanapalus. This first prince is represented as a crafty and mean-spirited knave; and at the same time, as nothing less than an hero. It is said, he was base enough to circumvent Arbaces his colleague and friend in the most shameful manner; by pretending a vow he had, in the midst of the war, made to his god Belus, That if success was the event of it, and the palace of Sardanapalus was consumed, as it was, he would be at the charge and trouble of removing the ashes that were left, to Babylon; where he would heap them up into a mount near the temple of his god; there to stand as a monument to all who should navigate the Euphrates, of the subversion of the Assyrian empire. He, it seems, had been privately informed, by an eunuch, of the immense treasure which had been consumed in the conflagration at Nineveh; and knowing it to be a secret to Arbaces, his avarice suggested to him this artifice. Arbaces not only granted him his request; but appointed him king of Babylon, with an exemption from all tribute. Belesis, by this artifice, carried a prodigious treasure with him to Babylon; but when the secret was discovered, he was called to an account for it, and tried by the other chiefs who had been assistant in the war, and who, upon his confession of the crime, condemned him to lose his head. But Arbaces, a magnificent and generous prince, freely forgave him, left him in possession of the treasure, and also in the independent government of Babylon, saying, The good he had done ought to serve as a veil to his crime; and thus he became at once a prince of great wealth and dominion.

In process of time, and under the successor of Arbaces, he became a man of dress, shew, and effeminacy, unworthy of the kingdom or province he held. Nanybrus, for so we must now call Belesis, understanding a certain robust Mede, called *Parfondas*, held him in the utmost contempt, and had solicited the emperor of the Medes to divest him of his dominions, and to confer them upon himself, offered a very great reward to the man who should take Parfondas, and bring him to him. Parfondas hunting somewhere near Babylon with the king of the Medes, and straggling from the company, happened to fall in with some of the servants of the Babylonian Nanybrus, who had been tempted with the promised reward. They were purveyors to the king; and Parfondas being very thirsty, asked them for a draught of wine; which they not only granted, but prevailed upon him to take a meal with them. As he drank freely, suspecting no treachery, he was easily persuaded to pass that night in company with some

Belerium,
Belesis.

Belesis.

beautiful women, brought on purpose to detain him. But, while he was in a profound sleep, the servants of Nanybrus rushing upon him, bound him, and carried him to their prince; who bitterly reproached him for endeavouring to estrange his master the king of the Medes from him, and by that means place himself in his room on the throne of Babylon. Parsondas did not deny the charge; but with great intrepidity owned, that he thought himself more worthy of a crown than such an indolent and effeminate prince as he was. Nanybrus, highly provoked at the liberty he took, swore by the gods Belus and Molis, or rather Mylitta, that Parsondas himself should in a short time become so effeminate as to reproach none with effeminacy. Accordingly, he ordered the eunuch who had the charge of his music-women, to shave, paint, and dress him after the manner of those women, to teach him the art, and in short to transform him by all possible means into a woman. His orders were obeyed; and the manly Parsondas soon exceeded the fairest female in singing, playing, and the other arts of allurements.

In the mean time the king of the Medes, having in vain sought after his favourite servant, and in vain offered great rewards to such as should give him any information concerning him, concluded he had been destroyed by some wild beast in the chase. At length, after seven years, the Mede was informed of his state and condition by an eunuch, who, being cruelly scourged by Nanybras's order, fled, at the instigation of Parsondas, into Media; and there disclosed the whole to the king, who immediately dispatched an officer to demand him. Nanybras pretended to know nothing of any such person; upon which another officer was sent by the Mede, with a peremptory order to seize on Nanybrus if he persisted in the denial, to bind him with his girdle, and lead him to immediate execution. This order had the desired effect: the Babylonian owned what he had before denied, promising to comply, without further delay, with the king's demand; and in the mean time invited the officer to a banquet, at which 150 women, among whom was Parsondas, made their appearance, singing and playing upon various instruments. But, of all, Parsondas appeared by far the most charming; insomuch, that Nanybrus inquiring of the Mede which he liked best, he immediately pointed at him. At this the Babylonian clapt his hands; and, falling into an immoderate fit of laughter, told him who the person was whom he thus preferred to all the rest; adding, that he could answer what he had done before the king of the Medes. The officer was no less surpris'd at such an astonishing change than his master was afterwards, when Parsondas appeared before him. The only favour Parsondas begged of the king, for all his past services, was, that he would avenge on the Babylonian the base and highly injurious treatment he had met with at his hands. The Mede marched accordingly at his instigation to Babylon; and, notwithstanding the remonstrances of Nanybrus, urging, that Parsondas had, without the least provocation, endeavoured to deprive him of both his life and kingdom, declared that in ten days time he would pass the sentence on him which he deserved, for presuming to act as judge in his own cause, instead of appealing to him. But Nanybrus having in the mean time gained with a large bribe Mitraphernes the Mede's favourite eunuch,

the king was by him prevailed upon to sentence the Babylonian only to a fine; which made Parsondas curse the man who first found out gold, for the sake of which he was to live the sport and derision of an effeminate Babylonian.

BELESME, a town of Perche in France, in W. Long. 0. 16. N. Lat. 48. 23.

BELEZERO, a town of Russia, and capital of a province of the same name. It is situated on the south-east shore of the White Sea, in E. Long. 36. 10. N. Lat. 61. 50.

BELFAST, a town of Ireland, in the county of Antrim. It is seated at the bottom of Carrickfergus bay, and is the chief town and port in this part of Ireland, as well for beauty and the number of its inhabitants, as for its wealth, trade, and shipping. It has a considerable trade with Glasgow, and the inhabitants are mostly Scots, and of the Presbyterian religion. W. Long. 6. 15. N. Lat. 54. 38.

BELFRY, BELFREDUS, is used by military writers of the middle age for a sort of tower erected by besiegers to overlook and command the place besieged. Belfry originally denoted a high tower, whereon centinals were placed to watch the avenues of a place, and prevent surprise from parties of the enemies, or to give notice of fires by ringing a bell. In the cities of Flanders, where there is no belfry on purpose, the tower of the chief church serves the same end. The word *belfry* is compounded of the Teutonic *bell*, and *freid* "peace," because the bells were hung for preserving the peace.

BELFRY is also used for that part of a steeple wherein the bells are hung. This is sometimes called by middle-age writers *campanile*, *clocaria*, and *triflegum*.

BELFRY is more particularly used for the timber-work which sustains the bells in a steeple, or that wooden structure to which the bells in church-steeples are fastened.

BELGÆ (anc. geog.), a people of Britain, to the west: Now Hampshire, Wiltshire, and Somersetshire, (Camden).

BELGICA, a town of the Ubii in Gallia Belgica, midway between the rivers Rhine and Roer: Now called *Balchusen* (Cluverius); a citadel of Juliers (Baudrand).

BELGICA Gallia, one of Cæsar's three divisions of Gaul, contained between the ocean to the north, the rivers Seine and Marne to the west, the Rhine to the east, but on the south at different times within different limits. Augustus, instituting every where a new partition of provinces, added the Sequani and Helvetii, who till then made a part of Celtic Gaul, to the Belgic (Pliny, Ptolemy). The gentilitious name is *Belga*, called by Cæsar the bravest of the Gauls, because untainted by the importation of luxuries. The epithet is *Belgicus* (Virgil).

BELGARDEN, a town of Germany, in East Pomerania, in the province of Cassubia, and subject to Prussia, E. Long. 16. 5. N. Lat. 54. 10.

BELGINUM, a town of the Treviri, in Gallia Belgica, Now called *Baldenau*, in the electorate of Triers.

BELGIUM, manifestly distinguished from Belgica, as a part from the whole (Cæsar); who makes Belgium the country of the Bellovacii; Hirtius adding the Atrebatæ. But as the Ambiani lay between the Bellovacii and Atrebatæ, we must also add these; and thus Belgium reached to the sea, because the Ambiani lay upon

Belesme

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Belgium.

Belgorod on it: and these three people constituted the proper and genuine Belgæ (all the rest being adventitious, or foreigners); and these were the people of Beauvais, Amiens, and Artois.

BELGOROD, a town of Russia, and capital of a province of the same name. It is seated on the river Donnets, in E. Long. 18. 5. N. Lat. 51. 20.

BELGOROD, a strong town of Bessarabia in European Turkey, seated at the mouth of the river Neister, on the Black Sea, 80 miles south-east of Bender. E. Long. 31. 0. N. Lat. 46. 30.

BELGRADE, a city of Turkey in Europe, and capital of Servia, seated at the confluence of the Save and the Danube, in E. Long. 21. 2. N. Lat. 45. 10. The Danube is very rapid near this city, and its waters look whitish. Belgrade is built on a hill, and was once large, strong, and populous. It was surrounded with a double wall, flanked with a great number of towers, and had a castle situated on a rising ground, and built with square stones. The suburbs are very extensive; and resorted to by Turkish, Jewish, Greek, Hungarian, and Slavonian merchants. The streets where the greatest trade is carried on are covered with wood, to shelter the dealers from the sun and rain. The rivers render it very convenient for commerce; and as the Danube falls into the Black Sea, the trade is easily extended to distant countries, which renders it the staple town in these parts; and as the Danube runs up to Vienna, they send goods from thence with a great deal of ease. The Armenians have a church here, and the Jews a synagogue, both these being employed as factors. The shops are but small; and the sellers sit on tables, disposing of their commodities out of a window, for the buyers never go on the inside. The richest merchandize are exposed to sale in two bezeiteins or bazars, built crosswise. There are two exchanges, built with stone, and supported with pillars not unlike the Royal Exchange at London. There is likewise a caravanserai or public inn, and a college for young students. It has been taken by the Turks and Imperialists alternately several times; but was ceded to the Turks in 1739, and the fine fortifications demolished.

BELGRADO, a town of Friuli, in the Venetian territories in Italy. It stands near the river Tejamento, in E. Long. 13. 5. N. Lat. 46. 0.

BELIA (anc. geog.), a town of hither Spain: Now *Belchite*, in the kingdom of Arragon. See **BELCHITE**.

BELIAL, בלעל, a Hebrew word which signifies a wicked worthless man, one who is resolved to endure no subjection. Thus the inhabitants of Gibeah, who abused the Levite's wife (Judges xix. 22.), have the name of Belial given them. Hophni and Phineas, the high priest Eli's sons, are likewise called sons of Belial (1 Sam. ii. 12.), upon account of the several crimes they had committed, and the unbecoming manner in which they behaved themselves in the temple of the Lord. Sometimes the name Belial is taken to denote the devil. Thus St Paul says (2 Cor. vi. 15.) "What concord hath Christ with Belial?" Whence it appears, that in his time the Jews, under the name of Belial, commonly understood the devil in the places where this term occurs in the Old Testament.

BELIDOR (Bernard Forest de), a Catalonian engineer in the service of France, and member of the academies of sciences at Paris and Berlin, and of the

royal society at London; a celebrated mathematician, and author of a number of military tracts in which the science of mathematics is applied to military uses. Died in 1765, aged 70.

BELIEF, in its general and natural sense, denotes a persuasion, or a strong assent of the mind to the truth of any proposition. In which sense, belief has no relation to any particular kind of means or arguments, but may be produced by any means whatever. Thus we are said to believe our senses, to believe our reason, to believe a witness, &c. And hence, in rhetoric, all sorts of proofs, from whatever topics deduced, are called *argumenta*, because apt to get belief or persuasion touching the matter in hand.

BELIEF, in its more restrained and technical sense, invented by the schoolmen, denotes that kind of assent which is grounded only on the authority or testimony of some person or persons, asserting or attesting the truth of any matter proposed.

In this sense, belief stands opposed to knowledge and science. We do not say we believe that snow is white, or that the whole is equal to its parts; but we see and know them to be so. That the three angles of a triangle are equal to two right angles, or that all motion is naturally rectilinear, are not said to be things credible, but scientific; and the comprehension of such truths is not belief but science.

But when a thing propounded to us is neither apparent to our sense, nor evident to our understanding; neither certainly to be collected from any clear and necessary connection with the cause from which it proceeds, nor with the effects which it naturally produces; nor is taken up upon any real arguments, or relation thereof to other acknowledged truths; and yet, notwithstanding, appears as true, not by manifestation, but by an attestation of the truth, and moves us to assent, not of itself, but in virtue of a testimony given to it—this is said to be properly credible; and an assent to this is the proper notion of belief or faith.

BELIEVERS, an appellation given toward the close of the first century to those Christians who had been admitted into the church by baptism, and instructed in all the mysteries of religion. They had also access to all the parts of divine worship, and were authorized to vote in the ecclesiastical assemblies. They were thus called in contradistinction to the catechumens, who had not been baptized, and were debarred from these privileges.

BELIO (anc. geog.), a river of Lusitania, called otherwise *Limeas*, *Limeas*, *Limias*, and *Lethe*, or the *River of Oblivion*: the boundary of the expedition of Decimus Brutus. The soldiers refusing out of superstition to cross, he snatched an ensign out of the hands of the bearer, and passed over, by which his army was encouraged to follow (Livy). He was the first Roman who ever proceeded so far, and ventured to cross. The reason of the appellation, according to Strabo, is, that in a military expedition a sedition arising between the Celtici and Turduli after crossing that river, in which the general was slain, they remained dispersed there; and from this circumstance it came to be called the *River of Lethe* or *Oblivion*. Now called *El Lima*, in Portugal, running westward into the Atlantic, to the south of the Minho.

BELISARIUS, general of the emperor Justinian's army,

Belief
||
Belisarius.

Belisarius,
Bell.

army, who overthrew the Persians in the East, the Vandals in Africa, and the Goths in Italy. See *ROME*. But after all his great exploits, he was falsely accused of a conspiracy against the emperor. The real conspirators had been detected and seized, with daggers hidden under their garments. One of them died by his own hand, and the other was dragged from the sanctuary. Pressed by remorse, or tempted by the hopes of safety, he accused two officers of the household of Belisarius; and torture forced them to declare that they had acted according to the secret instructions of their patron. Posterity will not hastily believe, that an hero who in the vigour of life had disdained the fairest offers of ambition and revenge, should stoop to the murder of his prince, whom he could not long expect to survive. His followers were impatient to fly; but flight must have been supported by rebellion, and he had lived enough for nature and for glory. Belisarius appeared before the council with less fear than indignation: after 40 years service, the emperor had prejudged his guilt; and injustice was sanctified by the presence and authority of the patriarch. The life of Belisarius was graciously spared: but his fortunes were sequestered; and, from December to July, he was guarded as a prisoner in his own palace. At length his innocence was acknowledged; his freedom and honours were restored; and death, which might be hastened by resentment and grief, removed him from the world about eight months after his deliverance. That he was deprived of his eyes, and reduced by envy to beg his bread, "Give a penny to Belisarius the general!" is a fiction of later times; which has obtained credit, or rather favour, as a strange example of the vicissitudes of fortune.—The source of this idle fable may be derived from a miscellaneous work of the 12th century, the *Chiliads* of John Tzetzes, a monk. He relates the blindness and beggary of Belisarius in ten vulgar or political verses (*Chiliad* iii. N° 88. 339—348. in *Corp. Poet. Græc.* tom. ii. p. 311).

Εκπώμα ξυλινον κρατων εβρα τω μιλιω
Βελισαριω οβολον δοτε τω στρατηλατη
Ον τυχη μιν εδοξασει, αποτυφλοι δ' ο φθονος.

This moral or romantic tale was imported into Italy with the language and manuscripts of Greece; repeated before the end of the 15th century by Crinitus, Pontanus, and Volaterranus; attacked by Alciat for the honour of the law, and defended by Baronius (A. D. 561 N° 2, &c.) for the honour of the church. Yet Tzetzes himself had read in other chronicles, that Belisarius did not lose his sight, and that he recovered his fame and fortunes.—The statue in the Villa Borg-hese at Rome, in a sitting posture, with an open hand, which is vulgarly given to Belisarius, may be ascribed with more dignity to Augustus in the act of propitiating Nemesis (*Winckleman, Hist. de l'Art.* tom. iii. p. 266). "Ex nocturno visu etiam stipem, quotannis, die certo, emendicabat a populo, cavam manum asses porrigentibus prebens." (*Sueton. in Aug.* c. 91.)

BELL, a well known machine ranked by musicians among the musical instruments of percussion.

The constituent parts of a bell are the body or *barrel*, the *clapper* on the inside, and the ear or *cannon* by which it hangs to a large beam of wood. The matter of which it is usually made is a composition called *bell-*

metal. The thickness of a bell's edges is usually $\frac{1}{12}$ of the diameter, and its height 12 times its thickness. The bell-founders have a diapason, or bell-scale, where-with they measure the size, thickness, weight, and tone, of their bells. For the method of casting bells, see *FOUNDRY*.

The sound of a bell is conjectured to consist in a vibratory motion of its parts, much like that of a musical chord. The stroke of the clapper must necessarily change the figure of the bell, and of a round make it oval: but the metal having a great degree of elasticity, that part will return back again which the stroke drove farthest off from the centre, and that even some small matter nearer the centre than before; so that the two parts which before were extremes of the longest diameter, do then become those of the shortest; and thus the external surface of the bell undergoes alternate changes of figure, and by that means gives that tremulous motion to the air in which the sound consists. M. Perrault maintains, that the sound of the same bell or chord is a compound of the sounds of the several parts thereof; so that where the parts are homogeneous, and the dimensions of the figure uniform, there is such a perfect mixture of all these sounds as constitutes one uniform, smooth, even sound; and the contrary circumstances produce harshness. This he proves from the bells differing in tone according to the part you strike; and yet strike it any where, there is a motion of all the parts. He therefore considers bells as a compound of an infinite number of rings, which according to their different dimensions have different tones, as chords of different lengths have; and when struck, the vibrations of the parts immediately struck determine the tone, being supported by a sufficient number of consonant tones in the other parts.

Bells are observed to be heard farther placed on plains than on hills; and still farther in valleys than on plains: the reason of which will not be difficult to assign, if it be considered that the higher the sonorous body is, the rarer is its medium: consequently, the less impulse it receives, and the less proper vehicle it is to convey it to a distance.

Mr Reamur, in the *Memoirs* of the Paris Academy, has the following observations relating to the shape most proper for bells, to give them the loudest and clearest sound. He observes, "that as pots and other vessels more immediately necessary to the service of life were doubtless made before bells, it probably happened that the observing these vessels to have a sound when struck, gave occasion to making bells, intended only for sound, in that form; but that it does not appear that this is the most eligible figure; for lead, a metal which is in its common state not at all sonorous, yet becomes greatly so on its being cast into a particular form, and that very different from the common shape of bells. In melting lead for the common occasions of casting in small quantities, it is usually done in an iron ladle: and as the whole is seldom poured out, the remainder, which falls to the bottom of the ladle, cools into a mass of the shape of that bottom. This is consequently a segment of a sphere, thickest in the middle, and thinner towards the edges; nor is the ladle any necessary part of the operation, since if a mass of lead be cast in that form in a mould of earth or sand, in any

of

Bell.

of these cases it is found to be very sonorous. Now if this shape alone can give sound to a metal which in other forms is perfectly mute, how much more must it necessarily give it to other metals naturally sonorous in whatever form? It should seem, that bells would much better perform their office in this than in any other form: and that it must particularly be a thing of great advantage to the small bells of common house-clocks, which are required to have a shrill note, and yet are not allowed any great size." He adds, "that had our forefathers had opportunities of being acquainted with the sound of metals in this shape, we should probably have had all our bells at present of this form."

The use of bells is very ancient, as well as extensive. We find them among Jews, Greeks, Romans, Christians, and Heathens, variously applied; as on the necks of men, beasts, birds, horses, sheep: but chiefly hung in buildings, either religious, as in churches, temples, and monasteries; or civil, as in houses, markets, baths; or military, as in camps and frontier towns.

Among the Jews it was ordained, that the lower part of the blue tunic which the high priest wore when he performed religious ceremonies, should be adorned with pomegranates and gold bells, intermixed equally and at equal distances. As to the number of the bells worn by the high priest, the scripture is silent; and authors are not very well agreed: but the sacred historian has let us into the use and intent of them in these words (Exod. xxviii. 33—35.), "And it shall be upon Aaron to minister, and his sound shall be heard when he goeth into the holy place before the Lord, and when he cometh out, that he die not." The kings of Persia are said to have the hem of their robes adorned like the Jewish high-priests with pomegranates and gold bells. It was, in the opinion of Calmet, with a design of giving notice that the high-priest was passing by, that he wore little bells on the hem of his robe; or rather it was as it were a kind of public notice that he was going to the sanctuary: for as, in the king of Persia's court, no one was suffered to enter the apartments without giving notice thereof by the sound of something; so the high priest, out of respect to the divine presence residing in the holy of holies, did, by the sound of little bells fastened to the bottom of his robe, desire as it were permission to enter, that the sound of the bells might be heard, and he not be punished with death for an unmannerly intrusion. The figure of these bells is not known to us. The prophet Zachariah (xiv. 20.) speaks of bells hung to war horses. "In that day (says the prophet) there shall be upon the bells of horses, Holiness unto the Lord."

Among the Greeks, those who went the nightly rounds in camps or garrisons, carried with them a little bell, which they rung at each centry-box to see that the soldiers on watch were awake. A codonophorous or bell-man also walked in funeral processions, at a distance before the corps, not only to keep off the crowd, but to advertise the *flamen dialis* to keep out of the way, for fear of being polluted by the sight, or by the funerary music. The priest of Proserpine at Athens, called *hierophantus*, rung a bell to call the people to sacrifice.

There were also bells in the houses of great men to

call up the servants in a morning. Zonara assures us, that bells were hung with whips on the triumphal chariots of their victorious generals, to put them in mind that they were still liable to public justice.

Bells were put on the necks of criminals going to execution, that persons might be warned by the noise to get out of the way of so ill an omen as the sight of the hangman or the condemned criminal, who was devoted and just going to be sacrificed to the *dii manes*.

For bells on the necks of brutes, express mention is made of them in Phædras,—*Celsa cervice eminens, Clarumque collo jactans tintinnabulum*. Taking these bells away was construed by the civil law, theft; and if the beast was lost by this means, the person who took away the bells was to make satisfaction.

As to the origin of church-bells, Mr Whittaker * *Hist. of Manchester* observes, That bells being used, among other purposes, by the Romans to signify the times of bathing, were naturally applied by the Christians of Italy to denote the hours of devotion, and summon the people to church. The first application of them to this purpose is, by Polydore Virgil and others, ascribed to Paulinus bishop of Nola, a city of Campania, about the year 400. Hence, it is said, the names *nola* and *campana* were given them; the one referring to the city, the other to the country. Though others say they took the latter of these names, not from their being invented in Campania, but because it was here the manner of hanging and balancing them, now in use, was first practised; at least that they were hung on the model of a sort of balance invented or used in Campania; for in Latin writers we find *campana statera*, for a steelyard; and in the Greek *καμπανίζειν*, and *ponderare*, "to weigh." In Britain, bells were applied to church-purposes, before the conclusion of the seventh century, in the monastic societies of Northumbria, and as early as the sixth even in those of Caledonia. And they were therefore used from the first erection of parish-churches among us.—Those of France and England appear to have been furnished with several bells. In the time of Clothair II. king of France, and in the year 610, the army of that king was frightened from the siege of the city of Sens, by ringing the bells of St Stephen's church. The second excerpt of Egbert, about the year 750, which is adopted in a French Capitulary of 801, commands every priest, at the proper hours, to sound the bells of his church, and then to go through the sacred offices to God. And the council of Enham, in 1011, requires all the mulcts for sins to be expended in the reparation of the church, clothing and feeding the minister of God, and the purchase of church-vestments, church-books, and church-bells. These were sometimes composed of iron in France; and in England, as formerly at Rome, were frequently made of brass. And as early as the ninth century, there were many cast of a large size and deep note.

Ingulphus mentions, that Turketulus abbot of Croyland, who died about the year 870, gave a great bell to the church of that abbey, which he named *Guthlac*; and afterwards six others, viz. two which he called *Bartholomeu* and *Bettelin*, two called *Turketul* and *Tatwin*, and two named *Pega* and *Bega*, all which rang together; the same author says, *Non erat tunc tanta consonantia campanarum in tota Anglia*. Not long

Bell.

Bell.

long after, Kinsens archbishop of York gave two great bells to the church of St John at Beverly, and at the same time provided that other churches in his diocese should be furnished with bells. Mention is made by St Aldhem, and William of Malmesbury, of bells given by St Dunstan to the churches in the west. The number of bells in every church gave occasion to the curious and singular piece of architecture in the campanile or bell-tower; an addition, which is more susceptible of the grander beauties of architecture than any other part of the edifice, and is generally therefore the principle or rudiments of it. It was the constant appendage to every parish-church of the Saxons, and is actually mentioned as such in the laws of Athelstan.

The Greek Christians are usually said to have been unacquainted with bells till the ninth century, when their construction was first taught them by a Venetian. Indeed, it is not true that the use of bells was entirely unknown in the ancient eastern churches, and that they called the people to church, as at present, with wooden mallets. Leo Allatius, in his dissertations on the Greek temples, proves the contrary from several ancient writers. It is his opinion, that bells first began to be disused among them after the taking of Constantinople by the Turks; who, it seems, prohibited them lest their sound should disturb the repose of souls, which, according to them, wander in the air. He adds, that they still retain the use of bells in places remote from the intercourse of the Turks; particularly, very ancient ones in Mount Athos. F. Simon thinks the Turks prohibited the Christians the use of bells, rather out of political than religious reasons; inasmuch as the ringing of bells might serve as a signal for the execution of revolts, &c.

In the ancient monasteries we find six kinds of bells enumerated by Durandus, viz. *Squilla*, rung in the refectory; *cymbalum*, in the cloister; *nola*, in the choir; *nolula* or *dupla*, in the clock; *campana*, in the steeple; and *signum* in the tower. Beletius has much the same; only that for *squilla*, he puts *tintinnabulum*, and places the *campana* in the tower, and *campanella* in the cloister. Others place the *tintinnabulum* or *tinnisium*, in the refectory or dormitory; and add another bell called *corrigiuncula*, rung at the time of giving discipline, to call the monks to be flogged. The *cymbalum* is sometimes also said to have been rung in the cloister, to call the monks to meat.

In the funeral monuments of Weever, are the following particulars relating to bells: "Bells had frequently these inscriptions on them:

" *Funera plango, Fulgura frango, Sabbata pango,*
" *Excito lentos, Dissipo ventos, Paco cruentos.*

" In the Little Sanctuary at Westminster King Edward III. erected a clochier, and placed therein three bells for the use of St Stephen's chapel: about the biggest of them were cast in the metal these words:

" King Edward made mee thirtie thousand weight and three.
" Take me down and wey me, and more you shall fynd mee.

" But these bells being to be taken down in the reign of King Henry VIII. one writes underneath with a coale:

" But Henry the eight
" Will bait me of my weight." *Ibid.* 492.

This last distich alludes to a fact mentioned by Stow in his survey of London, ward of Farringdon Within, to wit, that near to St Paul's school stood a clochier, in which were four bells called *Jesus's bells*, the greatest in all England, against which Sir Miles Partridge staked an hundred pounds, and won them of King Henry VIII. at a cast of dice. Nevertheless it appears that abroad there are bells of greater magnitude. In the steeple of the great church at Roan in Normandy is a bell with this inscription:

*Je suis George d'Ambois,
Qui trente cinque mille pois.
Mes lui qui me pesera,
Trente six mill me trouera.*

I am George of Ambois,
Thirtie five thousand in pois:
But he that shall weigh me,
Thirtie six thousand shall find me. *Ibid.*

And it is a common tradition that the bells of King's-college chapel, in the university of Cambridge, were taken by Henry V. from some church in France, after the battle of Agincourt. They were taken down some years ago, and sold to Phelps the bell-founder in White-Chapel, who melted them down.

The uses of bells were summed up in the following distich, as well as that first above mentioned:

*Laudo Deum verum, plebem voco, conjugo clerum,
Defunctos ploro, pestem fugo, festa decoro.*

Matthew Paris observes, that anciently the use of bells was prohibited in time of mourning; though at present they make one of the principal ceremonies of mourning. Mabillon adds, that it was an ancient custom to ring the bells for persons about to expire, to advertise the people to pray for them; whence our passing-bells. The passing-bell, indeed, was anciently rung for two purposes: one, to bespeak the prayers of all good Christians for a soul just departing; the other, to drive away the evil spirits who stood at the bed's foot, and about the house, ready to seize their prey, or at least to molest and terrify the soul in its passage: but by the ringing of that bell (for Durandus informs us, evil spirits are much afraid of bells), they were kept aloof; and the soul, like a hunted hare, gained the start, or had what is by sportsmen called *law*. Hence, perhaps, exclusive of the additional labour, was occasioned the high price demanded for tolling the greatest bell of the church; for, that being louder, the evil spirits must go farther off to be clear of its sound, by which the poor soul got so much more the start of them: besides, being heard farther off, it would likewise procure the dying man a greater number of prayers. This dislike of spirits to bells is mentioned in the Golden Legend, by W. de Worde. "It is said, the evill spirytes that ben in the regyon of thayre, doute moche when they here the belles rongen: and this is the cause why the belles ben rongen whan it thondreth, and whan grete tempeste and outrages of wether happen, to the ende that the feinds and wycked spirytes shold be abashed and flee, and cease of the movynge of tempeste." Lobineau observes, that the custom of ringing bells at the approach of thunder, is of some antiquity; but that the design was not so much to shake the air, and so dissipate

Bell.

Bell.

disperse the thunder, as to call the people to church to pray that the parish might be preserved from that terrible meteor.

In the times of popery, bells were baptized and anointed *oleo chrismatis*: they were exorcised, and blessed by the bishop; from a belief, that, when these ceremonies were performed, they had power to drive the devil out of the air, to calm tempests, to extinguish fire, and to recreate even the dead. The ritual for these ceremonies is contained in the Roman pontifical; and it was usual in their baptism to give to bells the name of some saint. In Chauncy's history of Hertfordshire, page 383, is a relation of the baptism of a set of bells in Italy with great ceremony, a short time before the writing that book. The bells of the parish-church of Waddington in Bedfordshire had their names cast about the verge of every one in particular, with these rhiming hexameters:

Nomina Campanis hæc indita sunt quoque nostris.

1. *Hoc signum Petri pulsatur nomine Christi.*
2. *Nomen Magdalene campana sonat melode.*
3. *Sit nomen Domini benedictum semper in eum.*
4. *Musa Raphaelis sonat auribus Immanuelis.*
4. *Sum Rosa pulsata mundique Maria vocata.*

Weev. Fun. 122.

By an old chartulary, once in the possession of Weever the antiquary, it appears that the bells of the priory of Little Dunmow in Essex were, anno 1501, new cast, and baptized by the following names:

Prima in honore Sancti Michaelis Archangeli.

Secunda in honore S. Johannis Evangelisti.

Tertia in honore S. Johannis Baptisti.

Quarta in honore Assumptionis beate Mariæ.

Quinta in honore sancti Trinitatis, et omnium sanctorum.

Ib. 633.

The bells of Osney abbey near Oxford were very famous; their several names were Douce, Clement, Austin, Hautecler [potius Hautcleri], Gabriel, and John.

Nankin in China was anciently famous for the largeness of its bells; but their enormous weight brought down the tower, the whole building fell to ruin, and the bells have ever lain on the ground. One of these bells is near 12 English feet high, the diameter seven and an half, and its circumference 23; its figure almost cylindric, except for a swelling in the middle; and the thickness of the metal about the edges seven inches. From the dimensions of this bell, its weight is computed at 50,000 pounds, which is more than double the weight of that of Erfort, said by Father Kircher to be the greatest bell in the world. These bells were cast by the first emperor of the preceding dynasty, about 300 years ago. They have each their name; the hanger (*tchoui*), the eater (*che*), the sleeper (*choui*), the will (*fi*). Father le Compte adds, that there are seven other bells in Peking, cast in the reign of Youlo, each of which weighs 120,000 pounds. But the sounds even of their biggest bells are very poor; being struck with a wooden in lieu of an iron clapper.

The practice of ringing bells in change, or regular peals, is said to be peculiar to England; whence Britain has been termed the *ringing island*. The custom seems to have commenced in the time of the Saxons,

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and was common before the conquest. The ringing of bells, though a recreation chiefly of the lower sort, is in itself not incurious. The tolling a bell is nothing more than the producing a sound by a stroke of the clapper against the side of the bell, the bell itself being in a pendant position and at rest. In ringing, the bell, by means of a wheel and a rope, is elevated to a perpendicular; in its motion to this situation the clapper strikes forcibly on one side, and in its return downwards on the other side of the bell, producing at each stroke a sound. There are in London several societies of ringers, particularly one known by the name of the *College Youths*: of this it is said Sir Matthew Hale, lord chief justice of the court of King's Bench, was, in his youthful days, a member; and in the life of this learned and upright judge, written by Bishop Burnet, some facts are mentioned which favour this relation. In England the practice of ringing is reduced to a science, and peals have been composed which bear the name of the inventors. Some of the most celebrated peals now known were composed about 50 years ago by one Patrick. This man was a maker of barometers: in his advertisements he styled himself *Torricellian Operator*. from Torricelli, who invented instruments of this kind. In the year 1684, one Abraham Rudhall, of the city of Gloucester, brought the art of bell-founding to great perfection. His descendants in succession have continued the business of casting bells; and by a list published by them it appears, that at Lady day 1774 the family, in peals and odd bells, had cast to the amount of 3594. The peals of St Dunstan's in the East, and St Bride's, London, and St Martin's in the Fields Westminster, are in the number.

The music of bells is altogether melody; but the pleasure arising from it consists in the variety of interchanges, and the various succession and general predominance of the consonances in the sounds produced. Musical authors seem to have written but little upon this subject.

Electrical BELLS are used in a variety of entertaining experiments by electricians. The apparatus, which is originally of German invention, consists of three small bells suspended from a narrow plate of metal; the two outermost by chains, and that in the middle, from which a chain passes to the floor, by a filken string. Two small knobs of brass are also hung by filken strings, one on each side of the bell in the middle, which serve for clappers. When this apparatus is connected with an electrified conductor, the outermost bells suspended by the chains will be charged, attract the clappers, and be struck by them. The clappers becoming electrified likewise will be repelled by these bells, and attracted by the middle bell, and discharge themselves upon it by means of the chain extending to the floor. After this, they will be again attracted by the outermost bells; and this, by striking the bells alternately, occasion a ringing, which may be continued at pleasure. Flashes of light will be seen in the dark between the bells and clappers; and if the electrification be strong, the discharge will be made without actual contact, and the ringing will cease. An apparatus of this kind, connected with one of those conductors that are erected for securing buildings from lightning, will serve to give notice of the approach and passage of an electrical cloud.

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*Harvlin's
Hist of
Music,
Vol. IV.
p. 152.*

Bell

Bellai.

BELL-Animal. See ANIMALCULE, n° 24—28.*BELL-Metal.* See CHEMISTRY-Index.

BELL, in chemistry, denotes a glass vessel placed over some matter in a state of exhalation, either to collect the vapour or gather the flowers. Chemical bells are a sort of receptacles chiefly used in preparing the oil or spirit of sulphur, for gathering and condensing fumes into a liquor.

Diving-BELL. See DIVING.*BELL-Foundry.* See FOUNDRY.*BELL-Flower,* in botany. See CAMPANULA.*BELL-Weed,* in botany. See JACEA.

BELLA (Stefano de la), a most eminent engraver, was born at Florence A. D. 1610. His father was a goldsmith; and he himself began to work at his father's business. But whilst he was learning to draw, in order to perfect himself in that profession, some of the prints of Callot fell by accident into his hands; with which he was so delighted, that he prevailed upon his father to permit him to apply himself to engraving; and he became the disciple of Canta Gallina, who was also the instructor of Callot. De la Bella at first imitated the manner of Callot. His abilities soon began to manifest themselves; and as by degrees he acquired a facility in the handling of the point, he quitted the style in which he only shone as an imitator, and adopted one entirely his own, which in freedom and spirit is said even to have surpassed that of his fellow disciple. He went to Paris A. D. 1642, where he formed an acquaintance with Israel Silvestre, then newly returned from Rome; and he was much employed by Henriette the uncle of Silvestre. Some time after, Cardinal Richelieu engaged him to go to Arras and make drawings of the siege and taking of that town by the royal army; which drawings he engraved at his return. He also went to Holland, where, it is reported, he saw some of the prints of Rembrant Gerretsz, and attempted to imitate them; but finding he did not succeed to his expectations, he dropped that design, and continued to pursue his own manner, as most suitable to his genius. After abiding some considerable time at Paris, his family affairs obliged him to return to Florence; where he obtained a pension from the great Duke, and was appointed to instruct the prince Cosmus his son in the art of design. Being subject to violent pains in the head, his life was rendered very uncomfortable by this cruel disorder, which at last put an end to it A. D. 1664, when he was only 54 years of age. De la Bella drew very correctly, and with great taste. His works manifest much genius and vast fertility of invention. The fire and animation which appears in them compensates for their slightness; and we may reasonably expect to find them slight when we are told that he engraved 1400 plates.

BELLAC, a town of La Marche in France, situated on the little river Union. It contains about 770 houses, and 3000 inhabitants. E. Long. 1. 14. N. Lat. 46. 4.

BELLADONA, in botany, the trivial name of a species of Atropa. See ATROPA.

BELLAI (William du), lord of Langey, a French general, who signalized himself in the service of Francis I. He was also an able negociator, so that the emperor Charles V. used to say, "that Langey's pen had fought more against him than all the lances in France."

He was sent to Piedmont in quality of viceroy, where he took several towns from the Imperialists. His address in penetrating into the enemy's designs was surprising. In this he spared no expence, and thereby had intelligence of the most secret councils of the emperor and his generals. He was extremely active in influencing some of the universities of France to give their judgment agreeable to the desires of Henry VIII. king of England, when this prince wanted to divorce his queen, in order to marry Anne Bullen. It was then the interest of France to favour the king of England in this particular, it being an affront to the emperor, and a gratification to Henry, which might serve to form a strict alliance between him and Francis I. He was sent several times into Germany to the princes of the Protestant league, and was made a knight of the order of St Michael. He was also a man of learning, having given proofs of his abilities and genius as a writer. He composed several works; the most remarkable of which was, the History of his Own Times, in Latin; divided into ogdoades, that is, several parts, each consisting of eight books; most of which, however, have been lost. When Langey was in Piedmont in 1542 he had some remarkable intelligence which he was desirous himself to communicate to the king, and being very infirm, he ordered a litter for his conveyance; but after having passed the mountain of Tarara, betwixt Lyons and Roan, he found himself so extremely bad at St Saphorin that he was obliged to stop there, where he died the 9th of January, in the year 1543. He was buried in the church of Mans, and a noble monument was erected to his memory.

BELLARMIN (Robert), an Italian Jesuit, one of the best controversial writers of his time. In 1576 he read lectures at Rome on controversies: which he did with such applause, that Sixtus V. sending a legate into France in 1590, appointed him as a divine, in case any dispute in religion should happen to be discussed. He returned to Rome, and was raised successively to different offices, till at last, in 1599, he was honoured with a cardinal's hat; to accept of which dignity, it is said, they were obliged to force him by the threats of an anathema. It is certain, that no Jesuit ever did greater honour to his order than he; and that no author ever defended the cause of the Romish church in general, and that of the pope in particular, to more advantage. The Protestants have owned this sufficiently: for, during the space of 50 years, there was scarcely any considerable divine among them who did not fix upon this author for the subject of his books of controversy. Notwithstanding the zeal with which this Jesuit maintained the power of the pope over the temporality of kings, he displeased Sixtus V. in his work *De Romano Pontifice*, by not insisting that the power which Jesus Christ gave to his viceroy was direct, but only indirect; and had the mortification to see it put into the index of the inquisition, though it was afterwards removed. He left, at his death, to the Virgin Mary one half of his soul, and to Jesus Christ the other.—Bellarmin is said to have been a man of great chastity and temperance, and remarkable for his patience. His stature was low, and his mien very indifferent: but the excellence of his genius might be discovered from the traces of his countenance. He expressed

Bellai,
Bellarmin.

Bellatrix expressed himself with great perspicuity: and the words which he first made use of to explain his thoughts were generally so proper, that there appeared no rasure in his writings.

||
Bellegarde.

BELLATRIX, in astronomy, a ruddy glittering star of the second magnitude, in the left shoulder of Orion. It takes its name from *bellum*, as being anciently supposed to have a great influence in kindling wars, and forming warriors. Its longitude, according to Hevelius, for the year 1700, was $16^{\circ} 47' 20''$; and its latitude southward $16^{\circ} 52' 11''$.

BELLCLARE, a town of Ireland, in the province of Connaught and county of Sligo. W. Long. 9. 5. N. Lat. 53. 56.

BELLE, a town of the French Netherlands, seated in E. Long. 2. 40. N. Lat. 50. 45.

BELLEAU (Remi), a French poet, born at Nogent le Rotrou, in the territory of Perche, and province of Orleanois. He lived in the family of Rénatus of Lorraine, marquis of Elbeuf, general of the French galleys; and attended him in his expedition into Italy, in 1557. This prince highly esteemed Belleau for his courage; and having also a high opinion of his genius and abilities, entrusted him with the education of his son Charles of Lorraine. Belleau was one of the seven poets of his time who were denominated the *French Pleiades*. He wrote several pieces; and translated the odes of Anacreon into the French language, but in this he is thought not to have preserved all the natural beauties of the original. His pastoral pieces are in greatest esteem. His verses in that way (according to his eulogists) are expressed with such beauty and simplicity, that they seem to be a living picture of what they describe. He also wrote an excellent poem on the nature and difference of precious stones, which by some has been reputed his best performance. Belleau died at Paris, in the family of the duke d'Elbeuf, on the 6th of March, 1577. He was interred in the church De Peres Augustines, near the Pont-neuf: several eulogiums were made to his memory.

BELLEFOREST (Francis de), a French author, born in the province of Guienne, in 1530. He was but seven years of age when he lost his father; and his mother was left in poor circumstances, but she contributed all in her power to his education. He was supported some years by the queen of Navarre, sister to Francis I. Some time after he went to study at Bourdeaux; thence he removed to Toulouse: and at last to Paris, where he got acquainted with several men of learning, and was honoured with the friendship of many persons of quality. He wrote, 1. A history of the nine Charles's of France; 2. Annotations on the books of St Augustin; 3. An universal history of the world; 4. The chronicles of Nicholas Gillet, augmented; 5. An universal cosmography; 6. Annals, or a general history of France: and many other works. In short, he supported his family by writing books on whatever subject was proposed to him by the booksellers, according to the taste of the public. He died in 1583.

BELLEGARDE, a strong town of France in Roussillon, on the frontiers of Catalonia. It is an important place on account of its being a passage to the Pyrenean mountains. E. Long. 3. 0. N. Lat. 42. 20.

BELLEGARDE, a town of Burgundy in France, with

the title of a duchy. It is seated on the river Saone, in E. Long. 4. 0. N. Lat. 46. 57.

Belleisle.

BELLEISLE, an island of France, on the coast of Brittany. It is the largest of all the European islands belonging to the French king, being between 12 and 13 leagues in circumference. It is a mixture of craggy rocks and fertile soil; but the inhabitants are very poor, and the only trade carried on in it is the curing of pilchards. There are three harbours in the island, viz. Palais, Sauzon, and Goulford; every one of which labours under some capital defect, either in being exposed, shallow or dangerous in the entrance. It contains only one little city called *Le Palais*, three county towns, 103 villages, and about 5000 inhabitants. The island originally belonged to the earl of Cornouaille; but was afterwards yielded to the king, who in 1742 erected it into a duchy, in favours of marshal Belleisle. The town of Palais takes its name from a castle belonging to the duke de Belleisle, which stood in its neighbourhood; but was afterwards converted into a citadel fronting the sea, and strongly fortified. Its fortifications are composed principally of hornworks; and it is provided with two dry ditches, the one next the counterscarp, and the other so contrived as to secure the interior fortifications. This citadel is divided from the largest part of the town by an inlet of the sea, over which there is a bridge of communication. From the other part of the town, and which is most inhabited, it is only divided by its own fortifications and a glacis. In this state was the island in 1761, when an expedition was undertaken against it by a British fleet under the command of commodore Keppel, having on board a considerable land force commanded by general Hodgson. The fleet sailed from Spithead on the 29th of March, and arrived before Belleisle on the 7th of April. The next day it was agreed to attempt a landing on the south-east part of the island, in a sandy bay, near Lochmana point. Here the enemy were in possession of a little fort; they had moreover entrenched themselves on a hill excessively steep, the foot of which was scarped away. The attempt was made in three places with great resolution; but the British were at last repulsed with the loss of 500 men. It was not before the 25th of April that the weather allowed a second attempt. This was made on a very strong place, where the enemy were rather less attentive, on account of the excessive steepness and difficulty of climbing up the rocks. Besides the principal attack, two feints were made at the same time to distract the enemy, whilst the men of war directed their fire with great success on the hills. These manœuvres gave brigadier-general Lambert, with an handful of men, an opportunity of climbing up a very steep rock without molestation. This little body formed themselves in good order without delay, and were immediately attacked by 300 French. The British, however, sustained this attack until the whole corps of brigadier Lambert, which had now likewise ascended, came to their assistance, with whose help they repulsed the enemy. The landing of all the forces being soon after made good, the French were driven into the town of Palais. Here the chevalier de St Croix who commanded them, a brave and experienced officer, resolved to hold out to the last extremity; and it was not till the 7th of June that he capitulated, and the garrison

Belleisle,
Bellenden.

marched out with the honours of war. The island, however, was restored to the French by the treaty concluded in 1763.

BELLEISLE, an island of North America, lying at the mouth of the strait between the country of the Esquimaux, or New Britain, and the north end of Newfoundland; whence the straits take also the name of *Belleisle*. W. Long. 58. 5. N. Lat. 51. 50.

BELLENDEN, or BALLANTINE, (William), a Scotch writer who flourished in the beginning of the 17th century, was professor of humanity or belles-lettres at Edinburgh, and master of the requests to James I. of England. But the former is supposed to have been only nominal, or early given up, and the latter also to have consisted in the name only, since he appears to have resided almost constantly at Paris, where by the favour of his sovereign he was enabled to live in easy circumstances. There he published, in 1608, his *Cicero Princeps*, a singular work; in which he extracted, from Cicero's writings, detached passages, and comprised them into one regular body, containing the rules of monarchical government, with the line of conduct to be pursued, and the virtues proper to be encouraged, by the prince himself; and the treatise, when finished, he dedicated from a principle of patriotism and gratitude, to the son of his master, Henry, then Prince of Wales. Four years afterwards, namely, in 1612, he proceeded to publish another work of a similar nature, which he called *Cicero Consul, Senator Senatusque Romanus*, in which he treated with much perspicuity, and a fund of solid information, on the nature of the Consular office, and the constitution of the Roman Senate. Finding these works received, as they deserved, with the unanimous approbation of the learned, he conceived the plan of a third work, *De Statu prisce Orbis*, which was to contain a history of the progress of government and philosophy, from the times before the flood to their various degrees of improvement under the Hebrews, Greeks, and Romans. He proceeded so far as to print a few copies of this work, in the year 1615, when it seems to have been suggested that his treatises, *De Statu Principis*, *De Statu Reipublice*, and *De Statu Orbis*, being on subjects so nearly resembling each other, there might be a propriety in uniting them into one work, by republishing the two former, and intitling the whole *Bellendenus de Statu*. With this view, he recalled the few copies of his last work that were abroad, and after a delay of some months, published the three treatises together, under their new title, in 1616. These pieces have been lately reprinted by an ingenious political editor, who has thought proper to inscribe them to Mr Burke, Lord North, and Mr Fox, whose respective portraits are prefixed to each dedication, and whose talents and virtues he celebrates and defends in a preface of 76 pages, containing a very free and bold discussion of our public men and measures in very classical language, and a strong and satirical representation, under borrowed names of antiquity, of the chiefs of the other party, or the present ministry. Bellenden wrote another work, published after his death, *De tribus Luminibus Romanorum*, whom he conceives to be Cicero, Seneca, and the elder Pliny. The editor gives an account of this work, from whence he took his idea of drawing his characters of the three luminaries of Great Britain. He marks the proficien-

cy in Greek and Roman literature which once distinguished the Scotch, before the civil dissensions drove their brightest geniuses abroad, and celebrates the ardour for philosophy and literature so prevalent in North Britain at present. Dr Middleton has been charged with borrowing not only the matter, but the arrangement, of his "*Life of Cicero*," from Bellenden, without the least acknowledgment, and the editor confesses himself of this opinion. It is surprising how little is known of Bellenden or his writings: concerning his lineage, birth, private life, and death, no notices have been transmitted even by tradition.

BELLEROPHON, in fabulous history, the son of Glaucus king of Epirus, happening accidentally to kill his brother, fled to Prætus king of Aegæos, who gave him an hospitable reception: but Sthenobea, his queen, falling in love with the beautiful stranger, and finding that nothing could induce him to injure his benefactor, she accused him to her husband of an attempt to violate her honour. Prætus, however, not being willing to act contrary to the laws of hospitality, sent him to Iobates king of Lycia, and the father of Sthenobea, with letters desiring him to put him to death: whence the proverb *Bellerophontis literas afferet*, equivalent to *Litera Uria*. That prince, at the receipt of these letters, was celebrating a festival of nine days, which prevented Bellerophon's destruction. Iobates, however, sent him in the meantime to subdue the Solymi, the Amazons, and Lycians, and thought to get rid of him by exposing him to the greatest dangers; but by his prudence and courage he came off victorious. Iobates next employed him to destroy the Chimæra; when Minerva, or, according to others, Neptune, in consideration of his innocence, furnished him with the horse Pegasus, by whose assistance he killed the Chimæra. Iobates, on his return, being convinced of his truth and integrity, and charmed with his heroic virtues, gave him his daughter Philonoe in marriage, and declared him his successor; which when Sthenobea heard, she killed herself. Bellerophon at length growing vain with his prosperity, resolved, by the assistance of Pegasus, to ascend the skies; when Jupiter checked his presumption, by striking him blind in his flight; on which he fell down to the earth, and wandered till his death in contempt and misery; but Pegasus mounting into heaven, Jupiter placed him among the constellations.

BELLES LETTRES. Whether we consult the voluminous dictionaries of the French language, or those treatises that profess to point out the method of studying and teaching the belles lettres, we find not, in the one or the other, either a clear definition, or a succinct explication of the words *belles lettres*, nor any summary of those sciences which are comprehended under that general and collective denomination. It appears to be a vague term, under which every one may include whatever he thinks proper. Sometimes we are told that by the belles lettres is meant, the knowledge of the arts of poetry and oratory; sometimes that the true belles lettres are natural philosophy, geometry, and other essential parts of learning; and sometimes, that they comprehend the art of war, by land and sea: in short, they are made to include all that we know, and whatever we please; so that, in treating on the belles lettres, they talk of the use of the sacraments, &c. * Some comprehend under the term, all

Bellerophon.
Belles
Lettres.

* Rollin on
the Belles
Lettres.

Belle-ville those instructive and pleasing sciences which occupy the memory and the judgment, and do not make part either of the superior sciences, of the *polite arts* †, or of mechanic professions: hence they make history, chronology, geography, genealogy, blazonry, philology, &c. the *belles lettres*. In a word, it were an endless task to attempt to enumerate all the parts of literature which different learned men have comprehended under this title. Nor would it be of any use to the reader for us to pretend to fix the true import of the term. Whatever arts or sciences it may be supposed to include, they are severally explained in the course of this work.

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Bellini.
† See Arts
(polite)

BELLE-VILLE, a town of the Beaujolois in France, seated near the river Saone, in E. Long. 4. 46. N. Lat. 45. 5.

BELLEVOIS, painter of Sea-pieces, is known through all parts of Europe as a good painter, though no particulars have been handed down concerning his life. He died in 1684. His subjects are views of havens, sea-ports, shores, calms, and storms at sea: but in his calms he shows his peculiar excellence. Pictures of this master are often in public sales; and some of them, which seem of his best style, are sold for a tolerable price.

BELLEY, or **BELLAY**, a town of France, with a bishop's see, and capital of Bujey. It is seated near the river Rhone, in E. Long. 5. 50. N. Lat. 45. 43.

BELLINGHAM, a town of Northumberland in England. W. Long. 2. 10. N. Lat. 55. 10.

BELLINI (Gentil), a Venetian painter, born in the year 1421. He was employed by the republic of Venice, and to him and his brother the Venetians are indebted for the noble works which are to be seen in the council-hall. We are told that Mahomet II. emperor of the Turks, having seen some of his performances, was so struck with them, that he wrote to the republic, intreating them to send him. The painter accordingly went to Constantinople, where he did many excellent pieces. Amongst the rest, he painted the decollation of St John the Baptist, whom the Turks revere as a great prophet. Mahomet admired the proportion and shadowing of the work; but he remarked one defect in regard to the skin of the neck, from which the head was separated; and in order to prove the truth of his observation, he sent for a slave and ordered his head to be struck off. This sight so shocked the painter, that he could not be easy till he had obtained his dismissal; which the Grand Signior granted, and made him a present of a gold chain. The republic settled a pension upon him at his return, and made him a knight of St Mark. He died in 1501, in the 80th year of his age.

John Bellini, his brother, painted with more art and sweetness than he; and died in 1512, aged 90.

BELLINI (Laurence), an eminent physician, born at Florence in the year 1643. After having finished his studies in polite literature, he went to Pisa, where he was assisted by the generosity of the grand duke Ferdinand II. and studied under two of the most learned men of that age, Oliva and Borelli. Oliva instructed him in natural philosophy, and Borelli taught him mathematics. At 20 years of age, he was chosen professor of philosophy at Pisa, but did not continue long in this office; for he had acquired such a reputation for

his skill in anatomy, that the grand duke procured him a professorship in that science. This prince was often present at his lectures, and was highly satisfied with his abilities and performances. Bellini, after having held his professorship almost 30 years, accepted of an invitation to Florence, when he was about 50 years of age. Here he practised physic with great success, and was advanced to be first physician to the grand duke Cosmus III. He wrote the following books in Latin: 1. An anatomical discourse on the structure and use of the kidneys. 2. A speech by way of thanks to the serene duke of Tuscany. 3. Some anatomical observations, and a proposition in mechanics. 4. Of the urine and pulse, of blood-letting, fevers, and diseases of the head and breasts. 5. Several tracts concerning urine, the motion of the heart and bile, &c. He died January 8th, 1703, being 60 years of age. His works were read and explained publicly during his life, by the famous Scotch physician Dr Pitcairn, professor of physic in Leyden.

BELLINZONA, a town of Italy, in the Milanese, and one of the bailiwicks which the Swiss possess in that country. It is seated on the river Jesino, five miles above the place where it falls into the Lago Maggiore, and it is fortified with two strong castles formerly joined together by a wall flanked with towers; but the Swiss have demolished a part of the fortifications. E. Long. 9. 0. N. Lat. 46. 8.

BELLIS, the **DAISY**: A genus of the syngenesia order, belonging to the polygamia superflua class of plants; and in the natural method ranking under the 49th order, *Composita-discoides*. The receptacle is naked and conic; there is no pappus; the calyx is hemispherical, with equal scales; and the seeds are ovated.

Species, &c. 1. The perennis, with a naked stalk, having one flower. This is the common daisy, which grows naturally in pasture-lands in most parts of Europe. It is often a troublesome weed in the grass of gardens, so is never cultivated. Its leaves have a subtle subacid taste; and are recommended as vulneraries, and in asthmas and hectic fevers, as well as in such disorders as are occasioned by drinking cold liquors when the body has been much heated. Ludovici prefers this plant to those commonly used as antiscorbutics and resolvents of coagulated blood in hypochondriacal disorders. 2. The annua, with leaves on the lower part of the stalk, is a low annual plant growing naturally on the Alps and the hilly parts of Italy. It seldom rises more than three inches high; and hath an upright stalk garnished with leaves on the lower part: but the upper part is naked, supporting a single flower like that of the common daisy, but smaller. 3. The hortensis, or garden daisy, with a large double flower. This is generally thought to be only a variety of the common daisy; but Mr Miller assures us, that he was never able to improve the common daisy by culture, or to make the garden daisy degenerate into the common sort for want of it. The varieties of this species cultivated in gardens are, the red and white garden daisy; the double variegated garden daisy; the childing, or hen and chicken garden daisy: and the cock's-comb daisy with red and white flowers. The garden daisies flower in April and May, when they make a pretty variety, being intermixed with plants of the same growth: they should

Bellinzona,
Bellis.

Bellis
||
Bellori.

be planted in a shady border, and a loamy soil without dung, in which they may be preserved without varying, provided the roots are parted and transplanted every autumn. This is all the culture they require, except keeping them free from weeds. Formerly they were planted as edgings to borders; but for this purpose they are improper, because where fully exposed to the sun, they frequently die in large patches, whereby the edgings become bald in many places.

BELLIS Major. See CHRYSANTHEMUM.

BELLON, a distemper common in countries where they smelt lead-ore. It is attended with languor, intolerable pains and sensations of gripings in the belly, and generally costiveness.—Beasts, poultry, &c. as well as men, are subject to this disorder: hence a certain space round the smelting-houses is called *bellon-ground*, because it is dangerous for an animal to feed upon it.

BELLONA, in Pagan mythology, the goddess of war, is generally reckoned the sister of Mars, and some represent her as both his sister and wife. She is said to have been the inventress of the needle; and from that instrument is supposed to have taken her name *Βελλων*, signifying a *needle*. This goddess was of a cruel and savage disposition, delighting in bloodshed and slaughter; and was not only the attendant of Mars, but took a pleasure in sharing his dangers. She is commonly represented in an attitude expressive of fury and distraction, her hair composed of snakes clotted with gore, and her garments stained with blood: she is generally depicted driving the chariot of Mars, with a bloody whip in her hand; but sometimes she is drawn holding a lighted torch or brand, and at others a trumpet. Bellona had a temple at Rome, near the Circus Flaminius, before which stood the column of war, from whence the consul threw his lance when he declared war. She was also worshipped at Comana, in Cappadocia; and Camden observes, that in the time of the emperor Severus, there was a temple of Bellona in the city of York.

BELLONARII, in antiquity, priests of Bellona, the goddess of wars and battles. The bellonarii cut and mangled their bodies with knives and daggers in a cruel manner, to pacify the deity. In this they are singular, that they offered their own blood, not that of other creatures, in sacrifice. In the fury and enthusiasm wherewith they were seized on these occasions, they ran about raging, uttering prophecies, and foretelling blood and slaughter, devastations of cities, revolutions of states, and the like: whence Martial calls them *turba entheata Bellonæ*. In after-times, they seem to have abated much of their zeal and transport, and to have turned the whole into a kind of farce, contenting themselves with making signs and appearances of cutting and wounds. Lampridius tells us, the emperor Commodus, out of a spirit of cruelty, turned the farce again into a tragedy, obliging them to cut and mangle their bodies really.

BELLONIA (so named from the famous Petrus Bellonius, who left many valuable tracts on natural history, &c.), a genus of the monogynia order, belonging to the pentandria class of plants. Of this genus there is only one species known, *viz.* the aspera, with a rough balm leaf. This is very common in the warm islands of America.

BELLORI (John Peter), of Rome; a celebrated

antiquary and connoisseur in the polite arts: Author of the lives of the modern painters, architects, and sculptors, and of other works on antiquities and medals. He died in 1696.

BELLOVACI (anc. geog.), a people of Gallia Belgica, reckoned the bravest of the Belgæ; now the *Beauvaisis*, in the isle of France.

BELLOWS, a machine so contrived as to expire and inspire the air by turns, by enlarging and contracting its capacity. This machine is used in chambers and kitchens, in forges, furnaces, and founderies, to blow up the fire: it serves also for organs and other pneumatic instruments, to give them a proper degree of air. All these are of various constructions, according to their different purposes; but in general they are composed of two flat boards, sometimes of an oval, sometimes of a triangular figure: Two or more hoops, bent according to the figure of the boards, are placed between them; a piece of leather broad in the middle, and narrow at both ends, is nailed on the edges of the boards, which it thus unites together; as also on the hoops which separate the boards, that the leather may the easier open and fold again: a tube of iron, brass, or copper, is fastened to the undermost board, and there is a valve within, that covers the holes in the underboard to keep in the air.

Anacharsis the Scythian is recorded as the inventor of bellows. The action of bellows bears a near affinity to that of the lungs; and what we call blowing in the latter, affords a good illustration of what is called *respiring* in the former. Animal life itself may on some occasions be subsisted by blowing into the lungs with a pair of bellows. Dr Hooke's experiment to this effect is famous: having laid the thorax of a dog bare, by cutting away the ribs and diaphragm, pericardium, &c. and having cut off the aspera arteria below the epiglottis, and bound it on the nose of a bellows, he found, that as he blowed, the dog recovered, and as he ceased, fell convulsive; and thus was the animal kept alternately alive and dead above the space of an hour. There are bellows made wholly of wood, without any leather about them; one of which is preserved in the repository of the Royal Society; and Dr Plot describes another in the copper-works at Ellaston in Staffordshire. Ant. della Fruta contrived a substitute for bellows, to spare the expence thereof in the fusion of metals. This is called by Kircher *camera æolia*, and in England commonly the *water-bellows*; where water falling through a funnel into a close vessel, sends from it so much air continually as blows the fire. See the article FURNACE, where different blowing machines of this kind are described.

Smiths and founders bellows, whether single or double; are wrought by means of a rocker, with a string or chain fastened thereto, which the workman pulls. The bellow's pipe is fitted into that of the twel. One of the boards is fixed, so as not to play at all. By drawing down the handle of the rocker, the moveable board rises, and by means of a weight on the top of the upper board sinks again. The bellows of forges and furnaces of mines usually receive their motion from the wheels of a water-mill. Others, as the bellows of enamellers, are wrought by means of one or more steps or treddles under the workman's feet. Lastly, the bellows of organs are wrought

Bellovac.
Bellows.

Bellows
||
Belon.

Belone
||
Belt.

by a man called the *blower*; and in small organs by the foot of the player. Butchers have also a kind of blast or bellows of a peculiar make, by which they bloat or blow up their meat when killed, in order to piecing or parting it the better.

Bone BELLOWS, *φυστηρις οσσειος*, occur in Herodotus for those applied by the Scythians to the genitals of mares, in order to distend the uterus, and by this compression make them yield a greater quantity of milk.

Hessian BELLOWS are a contrivance for driving air into a mine for the respiration of the miners. This M. Papin improved, changing its cylindrical form into a spiral one; and with this, working it only with his foot, he could make a wind to raise two pound weight.

Hydrostatic BELLOWS. See HYDROSTATICS.

BELLUNESE, a territory of Italy, belonging to the Venetians. It lies between Friuli, Codorino, Feltrino, the bishopric of Trent and Tirol. It has good iron mines, but the only considerable place is Belluno.

BELLUNO, a town of Italy, in the Venetian territories, and capital of the Bellunese. It is a bishop's see; and is situated among the Alps, on the river Piave, between the towns Cadora and Trevigni, in E. Long. 12. 15. N. Lat. 46. 9.

BELLY, in anatomy, the same with what is more usually called *abdomen*. See ANATOMY, Part III.

BELMONTE, a town of Italy, in the hither Calabria, and kingdom of Naples. It is situated on the coast of the Tuscan sea, in E. Long. 16. 50. N. Lat. 39. 20.

BELOMANCY; BELOMANTIA, a kind of divination by means of arrows, practised in the east, but chiefly among the Arabians. The word is of Greek origin; compounded of *βελος* *arrow*, and *μαντεια* *divination*.

Belomancy has been performed in different manners. One was to mark a parcel of arrows, and put 11 or more of them into a bag: these were afterwards drawn out; and according as they were marked or not, they judged of future events.

Another way was to have three arrows, upon one of which was wrote, "God orders it me;" upon another, "God forbids it me;" and upon the third nothing at all. These were put into a quiver, out of which they drew one of the three at random; if it happened to be that with the first inscription, the thing they consulted about was to be done: if it chanced to be that with the second inscription, it was let alone; but if it proved that without inscription, they drew over again.

Belomancy is an ancient practice, and probably that which Ezekiel mentions, chap. xxi. 21. At least St Jerome understands it so, and observes that the practice was frequent among the Assyrians and Babylonians. Something like it is also mentioned in Hosea, chap. iv. only that staves are there mentioned instead of arrows, which is rather rhabdomancy than belomancy. Grotius, as well as Jerome, confounds the two together, and shows that it prevailed much among the Magi, Chaldeans, and Scythians; whence it passed to the Slavonians, and thence to the Germans, whom Tacitus observes to make use of it.

BELON (Peter), of Le Mans, the capital of Le

Maine a province of France, flourished about the middle of the 16th century. He published several books in Latin. He wrote in French, of birds, beasts, fishes, serpents, and the neglected culture of plants; and a book of Travels, or observations of many singularities and memorable things found in Greece, Asia, Judæa, Egypt, Arabia, and other foreign countries. He was murdered near Paris by one of his enemies, in 1564.

BELONE, in ichthyology, the trivial name of a species of esox. See Esox.

BELSHAZZAR, the last king of Babylon, generally supposed to be the son of Evil-merodach, and grandson to the great Nebuchadnezzar.—During the time that Babylon was besieged by Cyrus, Belshazzar made an entertainment for a thousand of his most eminent courtiers (Dan. v. 1, &c.); and being heated with wine, ordered that the vessels of gold and silver which his grandfather Nebuchadnezzar had taken out of the temple at Jerusalem might be brought to the banquetting house, that he and his princes, together with his wives and concubines, might drink out of them, which accordingly was done; and to add to their profaneness, in the midst of their cups, they sang songs in praise of their several idols. But it was not long before a damp was put to the king's mirth, by an hand appearing upon the wall, which in three words wrote the sentence of his condemnation. The king saw the hand that wrote; and, being exceedingly affrighted, commanded all his wise men, magicians, and astrologers, to be immediately called, that they might read the writing, and explain its meaning. When they came, the king promised, that whoever should expound this writing should be made the third person of his kingdom in place and power. But the Magi could comprehend nothing of this writing; which increased the disorder and uneasiness that the king was in, together with his whole court: whereupon, at the instance of the queen-mother, Daniel was sent for. The king made him the same offer of honours and presents that he had done to his own magicians if he would explain the writing. Daniel modestly refused those offers: but having undertaken to perform what he required of him, he first reproved the king with great freedom for his ingratitude to God, who had advanced him to the rank of a sovereign, and for the profanation of the vessels which were consecrated to his service; and then proceeded to the interpretation of the words, which were these, *Mene, Tekel, Upharsin*. *Mene*, says he, which signifies *number*, intimates, that the days both of your life and reign are numbered, or that you have but a short time to live; *Tekel*, which signifies *weight*, intimates, that you have been weighed in the balance of God's justice, and found too light; and *Upharsin* (or *Peres*, as Daniel has it, and means the same thing), which signifies a *fragment*, intimates, that your kingdom shall be divided and given to the Medes and Persians. Which accordingly came to pass: for that very night, in the midst of their feasting and revelling, the city was taken by surprise, Belshazzar slain, and the kingdom translated to Cyaxares, whom the Scripture calls *Darius the Mede*. See BABYLON.

BELT, the *Great*, a famous strait of Denmark between the island of Zealand and that of Funen, at the entrance of the Baltic Sea. It is not however so commodious,

Belt
Belturbet.

modious, nor so much frequented as the Sound. In 1658 the whole strait was frozen so hard, that Charles Gustavus king of Sweden marched over it with a design to take Copenhagen.

BELT, the *Leffer*, lies to the west of the Great Belt, between the island of Funen and the coast of Jutland. It is one of the passages from the German Ocean to the Baltic, though not three miles in breadth, and very crooked.

BELT, *Baltbeus*, properly denotes a kind of military girdle, usually of leather, wherewith the sword or other weapons are sustained.—Belts are known among the ancient or middle-age writers by divers names, as ζώνη, ζώνη, zona, cingulum, remeniculum, rinca or ringa, and baldrellus. The belt was an essential piece of the ancient armour; inasmuch that we sometimes find it used to denote the whole armour. In later ages, the belt was given to a person when he was raised to knight-hood; whence it has also been used as a badge or mark of the knightly order.

The denomination *belt* is also applied to a sort of bandages in use among surgeons, &c. Thus we meet with quicksilver belts, used for the itch; belts for keeping the belly light, and discharging the water in the operation of tapping, &c.

BELT is also a frequent disease in sheep, cured by cutting their tails off, and laying the sore bare; then casting mould on it, and applying tar and goose grease.

BELTS, in astronomy, two zones or girdles surrounding the body of the planet of Jupiter. See ASTRONOMY.

BELTS, in geography, certain straits between the German ocean and the Baltic. The belts belong to the king of Denmark, who exacts a toll from all ships which pass through them, excepting those of Sweden, which are exempted.

Pennant's
Tour.

BELTEIN, a superstitious custom observed in the Highlands of Scotland. It is a kind of rural sacrifice, performed by the herdsmen of every village on the first of May. They cut a square trench on the ground, leaving a turf in the middle: on that they make a fire of wood, on which they dress a large caudle of eggs, butter, oatmeal, and milk; and bring, besides the ingredients of the caudle, plenty of beer and whisky; for each of the company must contribute something. The rites begin with spilling some of the caudle on the ground, by way of libation: on that, every one takes a cake of oatmeal, upon which are raised nine square knobs, each dedicated to some particular being, the supposed preserver of their flocks and herds, or to some particular animal, the real destroyer of them: each person then turns his face to the fire, breaks off a knob, and flinging it over his shoulder, says, *This I give to thee, preserve thou my horses; this to thee, preserve thou my sheep*; and so on. After that they use the same ceremony to the noxious animal: *This I give to thee, O fox: spare thou my lambs; this to thee, O hooded crow! this to thee, O eagle!* When the ceremony is over, they dine on the caudle; and after the feast is finished, what is left is hid by two persons deputed for that purpose; but on the next Sunday they re-assemble and finish the reliques of the first entertainment.

BELTURBET, a town of Ireland in the county

of Cavan, and province of Ulster, situated on the river Earn, in W. Long. 7. 35. N. Lat. 54. 7.

BELTZ, or BELZO, a province of Red Russia in Poland, bounded by Leopold on the south, by Chelm on the north, Little Poland on the east, and Volhynia on the west. Its capital town is Beltz.

BELTZ, or *Belzo*, a town of Poland, and capital of the province of the same name, seated on the confines of Upper Volhynia, among marshes, in E. Long 25. 15. N. Lat. 50. 5.

BELVIDERE, in the Italian architecture, &c. denotes either a pavilion on the top of a building, or an artificial eminence in a garden; the word literally signifying a *fine prospect*.

BELVIDERE, a considerable town of Greece, and capital of a province of the same name in the Morea. The province lies on the western coast: it is the most fertile and rich in all the Morea; and from it the realms called *Belvederes* take their name. The town is situated in E. Long. 22. 0. N. Lat. 38. 5.

BELUGA. See DELPHIS.

BELVIDERE, in botany. See CHENOPODIUM.

BELUNUM, (anc. geog.), a town of Rhætia, above Feltria, in the territory of the Veneti; now *Bel-luno*, capital of the Bellunese in the territory of Venice. See BELLUNO.

BELUS, (anc. geog.), a small river of Galilee, at the distance of two stadia from Ptolemais, running from the foot of Mount Carmel out of the lake Cendevia. Near this place, according to Josephus, was a round hollow or valley, where was a kind of sand fit for making glass; which, though exported in great quantities, was found to be inexhaustible. Strabo says, the whole of the coast from Tyre to Ptolemais has a sand fit for making glass; but that the sand of the rivulet Belus and its neighbourhood is a better sort; and here, according to Pliny, the making of glass was first discovered.

BEMA, in antiquity, denotes a step or pace. The bema made a kind of itinerary measure among the Greeks, the length of which was equivalent to one cubit and two thirds, or to ten palms. Whence also the term *bematizein*, βηματίζειν, to measure a road.

BEMA, in ecclesiastical writers, denotes the altar or sanctuary in the ancient churches. In which sense *bema* made the third or innermost part of the church, answering to the chancel among us.

BEMA was also used for the bishops chair, seat, or throne, placed in the sanctuary. It was called *bema* from the steps by which it was to be ascended.

BEMA was also used for the reader's desk. This in the Greek church was denominated βημα γινωσκων, in the Latin church *ambo*.

BEMA is more peculiarly used for the Manichees altar, which was in a different place from that of the Catholics.

BEMA was also a denomination given by this sect to the anniversary of the day when Manes was killed, which with them was a solemn feast and day of rejoicing. One of the chief ceremonies of the feast consisted in setting out and adorning their bema or altar with great magnificence.

BEMBEA, a province of the kingdom of Angola in Africa. It is divided into Higher and Lower: and extends on one side along the sea, and on the other divides

Belts
Bemba.

Bembo
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Bench.

vides Angola from the foreign states on the south. The country is large, populous, and abounding with cattle; with the fat of which the inhabitants anoint their heads and bodies, and clothe themselves with their hides coarsely dressed. They are addicted to the same idolatrous superstitions with the rest of the natives, but speak a quite different language. The province is watered by a river called *Lutano*, or *San Francisco*, which abounds with crocodiles, sea-horses, and monstrous serpents, that do a great deal of mischief.

BEMBO (Peter), a noble Venetian, secretary to Leo X. and afterwards cardinal, was one of the best writers of the 16th century. He was a good poet both in Italian and Latin; but he is justly censured for the looseness and immodesty of some of his poems. He published, besides these, A History of Venice; Letters; and a book in praise of the Duke and Dukes of Urbino. He died in 1547, in the 72d year of his age.

BEMSTER, or BEMISTER, a town of Dorsetshire in England, seated on the river Bert, in W. Long. 3. 15. N. Lat. 50. 45.

BEN. See BEHN.

BEN, in pharmacy, the name of an exotic purgative fruit, of the size and figure of a nut; whence it is also called the *ben-nut*, sometimes *balanus myrsefica*, or *glans unguentaria*.

Naturalists distinguish two kinds of bens; viz. the great, *ben magnum*, which resembles the filbert, and is by some called *avellana purgatrix*, brought from America; and the small, *ben parvum*, brought from Ethiopia.

Ben-nuts yield, by expression, much oil, which, from its property of not becoming rancid, at least for years, is used as a menstruum for the extraction of the odoriferous part of flowers of jessamin, violets, roses, hyacinths, lilies of the valley, tuberoses, jonquils, clove julyflowers, and others, which like these yield little or no essential oil by distillation, but impart their fragrance to expressed oils. The method of impregnating oil of ben with the odour of flowers is this: Some fine carded cotton is dipped in the oil, and put in the bottom of a proper vessel. On this is spread a thick layer of fresh flowers, above which more cotton dipt in oil is placed; and thus alternately flowers and cotton are disposed, till the vessel (which may be made of tin, with a cover to be screwed on to it, or of porcelain) is full. By digestion during 24 hours in a water-bath, the oil will receive the odour of the flowers.

BENARES. See OBSERVATORY.

BENAVARRI, a town of the kingdom of Arragon in Spain, seated on the frontiers of Catalonia. E. Long. 0. 40. N. Lat. 41. 55.

BENAVENTO, a town of Spain, in the kingdom of Leon, and Terra di Campos, with the title of a duchy. It is seated on the river Ela, in W. Long. 5. 0. N. Lat. 42. 4.

BENAVIDUS, or BONAVITUS (Marcus Mantua), a celebrated civilian, taught civil law with reputation, during 60 years, at Padua the place of his birth; and died in 1582, aged 93. His principal works are, 1. *Collectanea super Jus Casareum*. 2. *Consiliorum*, tom. ii. 3. *Problematum legalium*. 4. *De illustribus Jurisconsultis*, &c.

BENCH, or BANC, in law. See BANC.

Free-BENCH signifies that estate in copyhold-lands

which the wife, being espoused a virgin, has, after the decease of her husband, for her dower, according to the custom of the manor. As to this free-bench, several manors have several customs; and in the manors of East and West Enbourne, in the county of Berks, and other parts of England, there is a custom, that when a copyhold tenant dies, the widow shall have her free-bench in all the deceased husband's lands, whilst she lives single and chaste; but if she commits incontinency, she shall forfeit her estate: nevertheless, upon her coming into the court of the manor, riding on a black ram, and having his tail in her hand, and at the same time repeating a form of words prescribed, the steward is obliged, by the custom of the manor, to re-admit her to her free-bench.

King's BENCH, a court in which the king was formerly accustomed to sit in person, and on that account was moved with the king's household. This was originally the only court in Westminster-hall, and from this it is thought that the courts of common pleas and exchequer were derived. As the king in person is still presumed in law to sit in this court, though only represented by his judges, it is said to have supreme authority; and the proceedings in it are supposed to be *coram nobis*, that is, before the king. This court consists of a lord chief justice and three other justices or judges, who are invested with a sovereign jurisdiction over all matters whether of a criminal or public nature. The chief justice has a salary of 5,500 l. and the other judges 2,400 l. each.

All crimes against the public good, though they do not injure any particular person, are under the cognizance of this court; and no private subject can suffer any unlawful violence or injury against his person, liberty, or possessions, but a proper remedy is afforded him here; not only for satisfaction of damages sustained, but for the punishment of the offender; and wherever this court meets with an offence contrary to the first principles of justice, it may punish it. It frequently proceeds on indictments found before other courts, and removed by *certiorari* into this. Persons illegally committed to prison, though by the king and council, or either of the houses of parliament, may be bailed in it; and in some cases even upon legal commitments. Writs of mandamus are issued by this court, for the restoring of officers in corporations, &c. unjustly turned out, and freemen wrongfully disfranchised.

The court of King's Bench is now divided into a crown side and plea side; the one determining criminal, and the other civil, causes.

On the crown side, or crown office, it takes cognizance of all criminal causes, from high treason down to the most trivial misdemeanour or breach of the peace. Into this court also indictments from all inferior courts may be removed by writ of *certiorari*; and tried either at bar, or at *nisi prius*, by a jury of the county out of which the indictment is brought. The judges of this court are the supreme coroners of the kingdom. And the court itself is the principal court of criminal jurisdiction known to the laws of England. For which reason, by the coming of the Court of King's Bench into any county (as it was removed to Oxford on account of the sickness in 1665), all former commissions of *oyer and terminer*, and general gaol-delivery, are at once absorbed and determined *ipso facto*: in the same manner

Bench.

Benchers
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Bending.

manner as, by the old Gothic and Saxon constitutions, *Jure vetusto obtinuit, quievissent omnia inferiora judicia, dicente jus rege.* Into this Court of King's Bench hath reverted all that was good and salutary of the *Star-chamber*.

On the plea-side, this court determines all personal actions commenced by bill or writ; as actions of debt, upon the case, detinue, trover, ejectment, trespass, waste, &c. against any person in the custody of the marshal of the court, as every person sued here is supposed to be by law.

The officers on the crown side are the clerk and secondary of the crown; and on the side of the pleas there are two chief clerks or prothonotaries, and their secondary and deputy, the custos brevium, two clerks of the papers, the clerk of the declarations, the signer and sealer of bills, the clerk of the rules, clerk of the errors, and clerk of the bails; to which may be added the filazers, the marshal of the court, and the crier.

Amicable BENCH. See *AMICABLE*.

BENCHERS, in the inns of court, the senior members of the society, who are invested with the government thereof.

BENCOOLEN, a fort and town of Asia, on the south-west coast of the island of Sumatra, belonging to the British. The place is known at sea by a slender mountain called the *Sugar Loaf*, which rises about 20 miles inland. About a quarter of a mile from the sea stands an Indian village, whose houses are small and low, and built on posts. The country about Bencoolen is mountainous and woody, and the air unwholesome, the mountains being continually covered with thick heavy clouds that produce lightning, thunder, and rain. There is no beef to be had, except that of buffaloes, which is not very palatable; and indeed provisions of all kinds, except fruit, are pretty scarce. The chief trade is in pepper, of which great quantities grow on the island. There are frequent bickerings betwixt the natives and the factory, to the no small injury of the East-India Company. The factory was once entirely deserted; and had not the natives found that trade decreased by reason of their absence, it is scarce probable that ever the English would have been invited there again. E. Long. 101. 5. S. Lat. 4. 5.

BEND, in heraldry, one of the nine honourable ordinaries, containing a third part of the field when charged, and a fifth when plain. It is sometimes, like other ordinaries, indented, ingrailed, &c. and is either dexter or sinister. See *HERALDRY*, n^o 19, 20.

In *BEND*, is when any things, borne in arms, are placed obliquely from the upper corner to the opposite lower, as the bend lies.

BENDER, a town of Bessarabia in European Turkey, seated on the river Niefter, in E. Long. 29. 5. N. Lat. 46. 40. It is remarkable for being the place of retreat of Charles XII. after he was defeated by the Russians at the battle of Pultowa in 1709.

BENDERMASSEN, a town of the island of Borneo in Asia, and capital of a kingdom of the same name. It has a good harbour; and stands in E. Long. 113. 50. S. Lat. 2. 40.

BENDIDA, in antiquity, a festival, not unlike the Bacchanalia, celebrated by the Athenians in honour of Diana.

BENDING, in a general sense, the reducing a

straight body into a curve, or giving it a crooked form.

The bending of timber-boards, &c. is effected by means of heat, whereby their fibres are so relaxed that you may bend them into any figure.

BENDING, in the sea-language, the tying two ropes or cables together: thus they say, *bend the cable*, that is, make it fast to the ring of the anchor; *bend the sail*, make it fast to the yard.

BENDS, in a ship, the same with what is called *wails*, or *wales*; the outmost timbers of a ship's side, on which men set their feet in climbing up. They are reckoned from the water, and are called the *first*, *second*, or *third bend*. They are the chief strength of a ship's sides; and have the beams, knees, and foot-hooks, bolted to them.

BENDY, in heraldry, is the field divided into four, six, or more parts, diagonally, and varying in metal and colour.—The general custom of England is to make an even number; but in other countries they regard it not, whether even or odd.

BENCAPED, among sailors. A ship is said to be *bencaped* when the water does not flow high enough to bring her off the ground, out of the dock, or over the bar.

BENEDETTO (St). a considerable town of the Mantuan, in Italy, in E. Long. 11. 25. N. Lat. 45. 0.

BENEDICITE, among ecclesiastical writers, an appellation given to the song of the three children in the fiery furnace, on account of its beginning with the word *benedicite*. The use of this song in Christian worship is very ancient, it appearing to have been sung in all the churches as early as St Chrysostom's time.

BENEDICT XIV. Pope, (Prosper Lambertini of Bologna), celebrated for his learning and moderation, which gained him the esteem of all sensible Protestants. He was the patron of learned men and celebrated artists; and an elaborate writer, on theological subjects. His works make 12 vols in folio. He died in 1758.

BENEDICT (St), the founder of the order of the Benedictin monks, was born in Italy, about the year 480. He was sent to Rome when he was very young, and there received the first part of his education. At 14 years of age he was removed from thence to Sublaco, about 40 miles distant. Here he lived a most ascetic life, and shut himself up in a cavern, where nobody knew any thing of him except St Romanus, who, we are told, used to descend to him by a rope, and to supply him with provisions. But being afterwards discovered by the monks of a neighbouring monastery, they chose him for their abbot. Their manners, however, not agreeing with those of Benedict, he returned to his solitude; whether many persons followed him, and put themselves under his direction, so that in a short time he built 12 monasteries. In the year 528, or the following, he retired to mount Cassino, where idolatry was still prevalent, there being a temple of Apollo erected here. He instructed the people in the adjacent country, and having converted them, he broke the image of Apollo, and built two chapels on the mountain. Here he founded also a monastery, and instituted the order of his name, which in time became so famous and extended over all Europe. It was here too that he composed his *Regula Monachorum*, which Gregory the Great speaks of as the most sensible and best written.

Bending
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Benedict.

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written piece of that kind ever published. The time of his death is uncertain, but is placed between 540 and 550. He was looked upon as the Eliha of his time; and is reported to have wrought a great number of miracles, which are recorded in the second book of the dialogues of St Gregory the Great.

BENEDICT, abbot of Peterborough, was educated at Oxford, became a monk in the monastery of Christ's church in Canterbury, and some time after was chosen prior by the members of that society. Though he had been a great admirer of Archbishop Becket, and wrote a life of that prelate, he was so much esteemed by Henry II. that by the influence of that prince he was elected abbot of Peterborough, A. D. 1177. He assisted at the coronation of Richard I. A. D. 1189; and was advanced to be keeper of the great seal, A. D. 1191. But he did not long enjoy this high dignity, as he died on Michaelmas day, A. D. 1193. Besides his Life of Archbishop Becket, he composed a History of Henry II. and Richard I. from A. D. 1170 to A. D. 1192; which hath been much and justly esteemed by many of our greatest antiquaries, as containing one of the best accounts of the transactions of those times. A beautiful edition of this work was published at Oxford, in two volumes, by Mr Hearne, A. D. 1735.

BENEDICTINS, in church-history, an order of monks, who profess to follow the rules of St Benedict.

The Benedictins, being those only that are properly called *monks*, wear a loose black gown, with large wide sleeves, and a capuche, or cowl, on their heads, ending in a point behind. In the canon law, they are styled *black friars*, from the colour of their habit.

The rules of St Benedict, as observed by the English monks before the dissolution of the monasteries, were as follows: They were obliged to perform their devotions seven times in 24 hours, the whole circle of which devotions had a respect to the passion and death of Christ: they were obliged always to go two and two together: every day in lent they were obliged to fast till six in the evening, and abated of their usual time of sleeping and eating; but they were not allowed to practise any voluntary austerity without leave of their superior: they never conversed in their refectory at meals, but were obliged to attend to the reading of the scriptures: they all slept in the same dormitory, but not two in a bed; they lay in their clothes: for small faults they were shut out from meals; for greater, they were debarred religious commerce, and excluded from the chapel; and as to incorrigible offenders, they were excluded from the monasteries. Every monk had two coats, two cowls, a table-book, a knife, a needle, and a handkerchief; and the furniture of their bed was a mat, a blanket, a rug, and a pillow.

The time when this order came into England is well known; for to it the English owe their conversion from idolatry. In the year 596, Pope Gregory sent hither Augustin, prior of the monastery of St Andrew at Rome, with several other Benedictin monks. St Augustine became archbishop of Canterbury; and the Benedictins founded several monasteries in England, as also the metropolitan church of Canterbury, and all the cathedrals that were afterwards erected.

Pope John XXII. who died in 1334, after an exact inquiry, found, that, since the first rise of the order, there had been of it 24 popes, near 200 cardinals, 7000

archbishops, 15,000 bishops, 15,000 abbots of renown, above 4000 saints, and upwards of 37,000 monasteries. There have been likewise of this order 20 emperors and 10 empresses, 47 kings and above 50 queens, 20 sons of emperors and 48 sons of kings; about 100 princesses, daughters of kings and emperors; besides dukes, marquesses, earls, countesses, &c. innumerable. The order has produced a vast number of eminent writers and other learned men. Their Rabanus set up the school of Germany. Their Alcuinus founded the university of Paris. Their Dionysius Exiguus perfected the ecclesiastical computation. Their Guido invented the scale of music; and their Sylvester, the organ. They boast to have produced Anselmus, Ildephonsus, Venerable Bede, &c.

There are nuns likewise who follow the rule of St Benedict; among whom those who call themselves *mitigated*, eat flesh three times a-week, on Sundays, Tuesdays, and Thursdays: the others observe the rule of St Benedict in its rigour, and eat no flesh unless they are sick.

BENEDICTION, in a general sense, the act of blessing, or giving praise to God, or returning thanks for his favours. Hence also benediction is still applied to the act of saying grace before or after meals. Neither the ancient Jews nor Christians ever eat without a short prayer. The Jews are obliged to rehearse 100 benedictions *per day*; of which 80 are to be spoken in the morning. The first treatise of the first order in the Talmud, intitled *Seraim*, contains the form and order of the daily benedictions. It was usual to give benediction to travellers on their taking leave; a practice which is still preserved among the monks. Benedictions were likewise given among the ancient Jews, as well as Christians, by imposition of hands. And when at length the primitive simplicity of the Christian worship began to give way to ceremony, they added the sign of the cross, which was made with the same hand, as before, only elevated, or extended. Hence benediction, in the modern Romish church, is used, in a more particular manner, to denote the sign of the cross made by a bishop, or prelate, as conferring some grace on the people. The custom of receiving benediction, by bowing the head before the bishops, is very ancient; and was so universal, that emperors themselves did not decline this mark of submission.—Under the name *benediction*, the Hebrews also frequently understand the presents which friends make to one another, in all probability because they are generally attended with blessings and compliments, both from those who give and those who receive them.

Nuptial BENEDICTION, the external ceremony performed by the priest in the office of matrimony. This is also called *sacerdotal* and *matrimonial benediction*, by the Greeks *προλογια* and *προελεσια*. The nuptial benediction is not essential to, but the confirmation of, a marriage in the civil law.

Beatic BENEDICTION, *benedictio beatica*, is the viaticum given to dying persons. The Pope begins all his bulls with this form: *Salutem et apostolicam benedictionem*.

BENEDICTION is also used for an ecclesiastical ceremony, whereby a thing is rendered sacred or venerable. In this sense benediction differs from consecration, as in the latter unction is applied, which is not in the former.

Benedic-
tion.

Benefice

former: Thus the chalice is consecrated, and the pix blessed; as the former, not the latter, is anointed: though, in the common usage, these two words are applied promiscuously.—The spirit of piety, or rather of superstition, has introduced into the Romish church benedictions for almost every thing. We read of forms of benedictions for wax-candles, for boughs, for ashes, for church-vessels, and ornaments; for flags or ensigns, arms, first-fruits, houses, ships, paschal eggs, cilicium or the hair-cloth of penitents, church-yards, &c. In general, these benedictions are performed by aspersions of holy water, signs of the cross, and prayers suitable to the nature of the ceremony. The forms of these benedictions are found in the Roman pontifical, in the Roman missal, in the book of ecclesiastical ceremonies printed in Pope Leo X.'s time, and in the rituals and ceremonies of the different churches which are found collected in father Martene's work on the rites and discipline of the church.

BENEFICE (*beneficium*), in middle-age writers, is used for a fee, sometimes denominated more peculiarly *beneficium militare*. In this sense, benefice was an estate in land, at first granted for life only; so called, because it was held *ex mero beneficio* of the donor: and the tenants were bound to swear fealty to the lord, and to serve him in the wars. In after-times, as these tenures became perpetual and hereditary, they left their name of *beneficia* to the livings of the clergy; and retained to themselves the name of *feuds*.

BENEFICE, in an ecclesiastical sense, a church endowed with a revenue for the performance of divine service; or the revenue itself assigned to an ecclesiastical person, by way of stipend, for the service he is to do that church.

All church-preferments, except bishoprics, are called *benefices*; and all benefices are, by the canonists, sometimes styled *dignities*: but we now ordinarily distinguish between benefice and dignity; applying dignity to bishoprics, deaneries, archdeaconries, and prebendaries; and benefice to parsonages, vicarages, and donatives.

Benefices are divided by the canonists into simple and sacerdotal. In the first there is no obligation but to read prayers, sing, &c. such are canonries, chaplainships, chantries, &c.: the second are charged with the cure of souls, or the direction and guidance of consciences; such as vicarages, rectories, &c.

The Romanists again distinguish benefices into regular and secular. *Regular* or titular benefices are those held by a religious, or a regular, who has made profession of some religious order; such are abbeyes, priories, conventuals, &c.; or rather, a regular benefice is that which cannot be conferred on any but a religious, either by its foundation, by the institution of some superior, or by prescription: for prescription, forty years possession by a religious makes the benefice regular. *Secular* benefices are only such as are to be given to secular priests, *i. e.* to such as live in the world, and are not engaged in any monastic order. All benefices are repeated secular, till the contrary is made to appear. They are called *secular benefices*, because held by seculars; of which kind are almost all cures.

The canonists distinguish three manners of vacating a benefice, viz. 1. *De jure*, when the person enjoying it is guilty of certain crimes expressed in those laws, as heresy, simony, &c. 2. *De facto*, as well as *de jure*, by

the natural death or the resignation of the incumbent; which resignation may be either express or tacit, as when he engages in a state, &c. inconsistent with it, as, among the Romanists, by marrying, entering into a religious order, or the like. 3. By the *sentence of a judge*, by way of punishment for certain crimes, as concubinage, perjury, &c.

Benefices began about 500. The following account of those in England is given as the fact by Dr Burn, viz. that there are 1071 livings not exceeding 10 l. *per annum*; 1467 livings above 10 l. and not exceeding 20 l. *per annum*; 1126 livings above 20 l. and not exceeding 30 l. *per annum*; 1049 livings above 30 l. and not exceeding 40 l. *per annum*; 884 livings above 40 l. and not exceeding 50 l. *per annum*; 5597 livings under 50 l. *per annum*. It must be 500 years before every living can be raised to 60 l. a-year by Queen Anne's bounty, and 339 years before any of them can exceed 50 l. a-year. On the whole, there are above 11,000 church preferments in England, exclusive of bishoprics, deaneries, canonries, prebendaries, priest-vicars, lay-vicars, secondaries, &c. belonging to cathedrals, or choristers, or even curates to well beneficed clergymen.

BENEFICE in *commendam* is that, the direction and management of which, upon a vacancy, is given or recommended to an ecclesiastic, for a certain time, till he may be conveniently provided for.

BENEFICIARII, in Roman antiquity, denote soldiers who attended the chief officers of the army, being exempted from other duty. Beneficarii were also soldiers discharged from the military service or duty, and provided with *beneficia* to subsist on. These were probably the same with the former, and both might be comprised in the same definition. They were old experienced soldiers, who, having served out their legal time, or received a discharge as a particular mark of honour, were invited again to the service, where they were held in great esteem, exempted from all military drudgery, and appointed to guard the standard, &c. These, when thus recalled to service, were also denominated *evocati*; before their recal, *emeriti*.

BENEFICIARIUS was also used for those raised to a higher rank by the favour of the tribunes or other magistrates. The word *beneficiarius* frequently occurs in the Roman inscriptions found in Britain, where *consulis* is always joined with it; but besides *beneficiarius consulis*, we find in Grutar *beneficiarius tribuni, pratorii, legati, praefecti, proconsulis*, &c.

BENEFICIARY, in general, something that relates to benefices.

BENEFICIARY, *Beneficiarius*, is more particularly used for a beneficed person, or him who receives and enjoys one or more benefices. A beneficiary is not the proprietor of the revenues of his church; he has only the administration of them, though unaccountable for the same to any but God.

BENEFICIARY is also used, in middle-age writers, for a feudatory or vassal. The denomination was also given to the clerks or officers who kept the accounts of the *beneficia*, and made the writings necessary there-to.

BENEFICIUM, in military matters among the Romans, denoted a promotion to a higher rank by the favour of some person in authority.

BENE-

Beneficiarii
Beneficium

Benefield
||
Benevento.

BENEFIELD (Sebastian), an eminent divine of the 17th century, was born in 1559, at Prestonbury in Gloucestershire, and educated at Corpus Christi college in Oxford. In 1608 he took the degree of doctor in divinity, and five years after was chosen Margaret professor in that university. He had been presented several years before to the rectory of Meysey-Hampton, in Gloucestershire. He published Commentaries upon the first, second, and third chapters of Amos; a considerable number of sermons; and some Latin treatises. He died in 1630.

BENEFIT OF CLERGY. See **CLERGY.**

BENESOEUF, a town of Egypt, seated on the western shore of the Nile, and remarkable for its hemp and flax. E. Long. 31. 0. N. Lat. 29. 10.

BENEVENTE, a town of the province of Leon, in Spain, seated on the river Eslla, in W. Long. 5. 5. N. Lat. 42. 4.

BENEVENTO, a city of Italy, in the kingdom of Naples, with an archbishop's see. It is situated near the confluence of the rivers Sabato and Calore, in a fertile valley called the *Strait of Benevento*, full of gentlemen's seats and houses of pleasure. This town hath frequently suffered terribly by earthquakes; particularly in 1703, when a great part of it was overturned, and the rest much damaged. E. Long. 14. 57. N. Lat. 41. 6.

The arch of Trajan, now called the *Porta Aurea*, forms one of the entrances to the city. This arch, though it appears to great disadvantage from the walls and houses that hem it in on both sides, is in tolerable preservation, and one of the most magnificent remains of Roman grandeur to be met with out of Rome. The architecture and sculpture are both singularly beautiful. This elegant monument was erected in the year of Christ 114, about the commencement of the Parthian war, and after the submission of Decebalus had intitled Trajan to the surname of Dacicus. The order is Composite; the materials, white marble; the height, 60 palms; length, 37 and a half; and depth 24. It consists of a single arch, the span of which is 20 palms, the height 35. On each side of it, two fluted columns, upon a joint pedestal, support an entablement and an attic. The intercolumniations and frieze are covered with basso-relievos, representing the battles and triumphs of the Dacian war. In the attic is the inscription. As the sixth year of Trajan's consulate, marked on this arch, is also to be seen on all the millitary columns he erected along his new road to Brundisium, it is probable that the arch was built to commemorate so beneficial an undertaking. Except the old metropolis of the world, no city in Italy can boast of so many remains of ancient sculpture as are to be found in Benevento. Scarce a wall is built of any thing but altars, tombs, columns, and remains of entablatures.

The cathedral is a clumsy edifice, in a style of Gothic, or rather Lombard, architecture. This church, dedicated to the Virgin Mary, was built in the sixth century, enlarged in the 11th, and altered considerably in the 13th, when archbishop Roger adorned it with a new front. To obtain a sufficient quantity of marble for this purpose, he spared neither sarcophagus, altar, nor inscription; but fixed them promiscuously and irregularly in the walls of his barbarous structure.

Three doors (a type of the Trinity, according to the rules established by the mystical Vitruvii of those ages) open into this facade. That in the centre is of bronze, embossed with the life of Christ, and the effigies of the Beneventine metropolitan, with all his suffragan bishops. The inside offers nothing to the curious observer but columns, altars, and other decorations, executed in the most inelegant style that any of the church-building barbarians ever adopted. In the court stands a small Egyptian obelisk, of red granite, crowded with hieroglyphics. In the adjoining square are a fountain and a very indifferent statue of Benedict XIII. long archbishop of Benevento.

Of the Beneventine history the following abstract is given by Mr Swinburne, in his *Travels in Sicily*. According to some authors (he informs us), Diomed was the founder of Beneventum; whence its origin must be referred to the "years that immediately succeeded the Trojan war. Other writers assign it to the Samnites, who made it one of their principal towns, where they frequently took refuge when worsted by the Romans. In their time, its name was *Maleventum*, a word of uncertain etymology: however, it sounded so ill in the Latin tongue, that the superstitious Romans, after achieving the conquest of Samnium, changed it into Beneventum, in order to introduce their colony under fortunate auspices. Near this place, in the 479th year of Rome, Pyrrhus was defeated by Curius Dentatus. In the war against Hannibal, Beneventum signalized its attachment to Rome, by liberal tenders of succour and real services. Its reception of Gracchus, after his defeat of Hanno, is extolled by Livy; and, from the gratitude of the senate, many solid advantages accrued to the Beneventines. As they long partook, in a distinguished manner, of the glories and prosperity of the Roman empires, they also severely felt the effects of its decline, and shared in a large proportion the horrors of devastation that attended the irruption of the northern nations.

"The modern history of this city will appear interesting to those readers who do not despise the events of ages which we usually and justly call dark and barbarous. They certainly are of importance to all the present states of Europe; or at that period originated the original existence of most of them. Had no northern savages descended from their snowy mountains, to overturn the Roman colossus, and break asunder the fetters of mankind, few of those powers, which now make so formidable a figure, would ever have been so much as heard of. The avengers of the general wrongs were, no doubt, the destroyers of arts and literature, and brought on the thick clouds of ignorance, which for many centuries no gleam of light could penetrate; but it is to be remembered, also, that the Romans themselves had already made great progress in banishing true taste and knowledge, and would very soon have been a barbarous nation, though neither Goths nor Vandals had ever approached the frontier.

"The Lombards came the last of the Scythian or Scandinavian hordes to invade Italy. After fixing the seat of their empire at Pavia, they sent a detachment to possess itself of the southern provinces. In 571, Zotto was appointed duke of Benevento, as a feudatory of the king of Lombardy; and seems to have

Beneven-
tum
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Benfield.

have confined his rule to the city alone, from which he sallied forth to seek for booty. The second duke, whose name was Arechis, conquered almost the whole country that now constitutes the kingdom of Naples. His successors appear long to have remained satisfied with the extent of dominion he had transmitted to them. Grimwald, one of them, usurped the crown of Lombardy; but his son Romwald, though a very successful warrior, contented himself with the ducal title. The fall of Desiderius, last king of the Lombards, did not affect the state of Benevento. By an effort of policy or resolution, Arechis the second kept possession; and availing himself of the favourable conjuncture, asserted his independence,—threw off all feudal submission,—assumed the style of Prince,—and coined money with his own image upon it; a prerogative exercised by none of his predecessors as dukes of Benevento. During four reigns, this state maintained itself on a respectable footing; and might long have continued so, had not civil war, added to very powerful assaults from abroad, hastened its ruin. Radelchis and Siconulph aspired to the principality; and each of them invited the Saracens to his aid. The desolation caused by this conflict is scarcely to be described. No better method for terminating these fatal dissensions could be devised than dividing the dominions into two distinct sovereignties. In 851, Radelchis reigned as Prince at Benevento; and his adversary fixed his court with the same title at Salerno. From this treaty of partition, the ruin of the Lombards became inevitable: a want of union undermined their strength,—foreigners gained an ascendant over them,—irresolution and weakness pervaded their whole system of government. The erection of Capua into a third principality was another destructive operation: and now the inroads of the Saracens, the attacks of the eastern and western emperors, anarchy and animosity at home, reduced the Lombard states to such wretchedness, that they were able to make a very feeble resistance to the Norman arms. The city of Benevento alone escaped their sway, by a grant which the emperor Henry II. had made of it to the bishop of Rome, in exchange for the territory of Bamberg in Germany, where the popes enjoyed a kind of sovereignty. From the year 1054 to this day, the Roman see, with some short interruptions of possession, has exercised temporal dominion over this city. Benevento has given three popes to the chair of St Peter; viz. Felix III. Victor III. and Gregory VIII. and, what it is much prouder of, reckons St Januarius in the list of its bishops."

BENEVENTUM (anc. geog.), a town of the Samnites, formerly called *Maleventum* from the unwholesomeness of the wind, and under that appellation it is mentioned by Livy; but after a Roman colony was led thither in the 485th year of the city, it came to have the name of *Beneventum*, as a more auspicious title. It is mentioned by Horace as an ancient city said to have been built by Diomedes before the Trojan war. Now **BENEVENTO**.

BENEVOLENCE, in morals, signifies the love of mankind in general, accompanied with a desire to promote their happiness. See **MORALS**.

BENFIELD, a town of Alsace in France, whose fortifications were demolished in consequence of the treaty of Westphalia. E. Long. 7. 45. N. Lat. 48. 14.

BENGAL, a country of Indostan in Asia, bounded on the east by the kingdoms of Assam, Tipra, and Arracan; on the west by Malva and Berar; on the north by Gehud, Rotas, Benares, and Jesuat; and on the south by Orixia and the bay of Bengal. Its greatest length from west to east is about 720 miles, and its breadth from south to north, where greatest, is not less than 300; though in some places not above 150; extending from 21 to 25 degrees of north latitude, and from 80 to 91 of east longitude.

As this country lies almost entirely within the torrid zone, and in the middle of a very extensive continent, it is sometimes subject to such extremes of heat as render it very fatal to European constitutions. Dr Lind is of opinion, that the climate of Bengal is the most dangerous in this respect of any of the English territories excepting Bencoolen on the coast of Sumatra. Part of this unhealthiness arises from the mere circumstance of heat; for in all the southern parts of India, when the wind blows over land, it is so extremely hot and suffocating as scarcely to be borne. The reason of this is evident from the mere inspection of a map of Asia, where it is evident that whatever wind blows over land, especially in the southern parts, must pass over an immense tract of country strongly heated by the sun; and as in every part of this extensive continent there are sandy deserts of very considerable magnitude, the heat is thus prodigiously increased. This becomes very evident on the falling of a shower of rain at the time the land-wind prevails; for if the wind in its way passes through the shower, the air is agreeably cooled though the sky should be ever so clear; while those who reside only at a few miles distance, but out of the direct line of the shower, will be fainting under the excessive heat. Here indeed, when the air is clear, the sun-beams are much more powerful than in our climate, insomuch that the light at noon-day is too powerful for the eyes to bear; and the large stars, as Venus and Jupiter, shine with a surprising lustre. Thus the reflexion of the sun-beams from the earth must necessarily occasion an extraordinary degree of heat in the atmosphere; so that from the winds above mentioned very great inconveniences sometimes arise, similar to those which are occasioned by the *Harmattan* in Africa. Mr Ives tells us, that it is affirmed they will snap glass if it be too much exposed to them; he has seen the veneering stripped off from a chest of drawers by their means; and they will certainly crack and chap almost every piece of wood that is not well seasoned. In certain places they are so loaded with sand, that the horizon appears quite hazy where they blow, and it is almost impossible to prevent the eyes from being thus greatly injured. They have likewise a very pernicious effect on such people as are exposed to them while sleeping. This seldom fails to bring on a fit of the *barbiers*, a kind of paralytic distemper attended with a total deprivation of the use of the limbs, and which the patient never gets the better of but by removing to some other climate. These hot winds are made use of with great success for cooling liquors, by wrapping a wet cloth round the bottles and exposing it to the air. The reason of this is explained under the article **EVAPORATION**. Mr Ives remarks, that it will thus cool much sooner than by being exposed to the cool sea-breeze.

Bengal.

Climate extremely unhealthy.

Extreme heat of the land wind, and its surprising effects.

Bengal.

3
Inunda-
tions of the
Ganges, &c.
described.

The great cause of the unhealthiness of Bengal, however, is owing to the inundations of the Ganges and Burrampooter, by which such quantities of putrescible matters are brought down as infect the air with the most malignant vapours when the waters retire. Though the rainy season begins in Bengal only in the month of June, the river begins to swell in the mountains of Thibet early in April, and by the latter end of that month in Bengal also. The reason of this is partly the melting of the snow on the mountains of Thibet, and partly the vast collection of vapours brought by the southerly or southwest monsoon, which are suddenly stopped by the high mountains of Thibet. Hence it is obvious, that the accumulation and condensation of these vapours must first take place in the neighbourhood of the mountains which oppose them; and thus the rainy season commences soonest in those places which lie nearest the mountains.

The rivers in Bengal begin to rise at first very slowly, the increase being only at the rate of one inch per day for the first fortnight. It then gradually augments to two and three inches before any quantity of rain falls in the low countries; and when the rain becomes general, the increase at a medium is five inches per day. By the latter end of July, all the lower parts of Bengal, contiguous to the Ganges and Burrampooter, are overflowed, and present a surface of water more than 100 miles wide. This vast collection of fluid, however, is owing in a great measure to the rains which fall on the low country itself; for the lands in the neighbourhood are overflowed some time before the bed of the river is filled. It must be observed, that the ground on the bank of the river, and even to some miles distance, is higher than that which is more remote; and thus a separation is made for a considerable time betwixt the waters of the land-flood and those of the river.

4
Some lands
guarded
from too
copious an
inundation.

As some of the lands in Bengal would receive damage from such a copious inundation, they must for this reason be guarded by strong dykes to resist the waters, and admit only a certain quantity. These, collectively taken, are said to be more than 1000 miles in length, and are kept up at an enormous expence; yet they do not always answer the purpose, on account of the looseness of the earth of which they are composed, even though some are of the thickness of an ordinary rampart at the base. One particular branch of the Ganges (navigable only in the rainy season, and then equal in size to the Thames at Chelsea) is conducted for 70 miles between dykes: and when full, the passengers look down upon the adjacent country as from an eminence.

5
Disasters
occasioned
by too
great an in-
undation.

As the tide loses its power of counteracting such an impetuous torrent of fresh water, the height of the inundation gradually diminishes as it approaches the sea, and totally vanishes at the point of confluence; which is owing to the facility with which the waters of the inundation spread over the level of the ocean. But when the force of winds conspires with that of the tide, the waters are retarded in such a manner as sometimes to raise the inundation two feet above the ordinary level; which has been known to occasion the loss of whole crops of rice. In the year 1763, a melancholy accident happened at Luckipour, when a strong gale of wind, conspiring with a high spring-tide, at a

season when the periodical flood was within a foot and an half of its highest pitch, the waters are said to have risen six feet above their ordinary level. Thus the inhabitants of a particular district were swept away with their houses and cattle; and to aggravate the distress, it happened in a part of the country where it was scarce possible to find a tree for a drowning man to escape to.

For some days before the middle of August the inundation is at a stand, and then begins to abate by a cessation of rains in the mountains, though great quantities still continue to fall on the low country. The inundation does not, however, in its decrease, always keep pace with that of the river, by reason of the height of the banks; but after the beginning of October, when the rain has nearly ceased, the remainder goes off quickly by evaporation, leaving the ground exceedingly fertilized.

From the time that the monsoon changes in October to the middle of March, the rivers are in a state of tranquillity; when the north-west winds begin, and may be expected once in three or four days till the commencement of the rainy season. These are the most formidable enemies of the inland navigation carried on by the large rivers. They are sudden and violent squalls, attended with rain; and though their duration is commonly but short, sometimes produce fatal effects, whole fleets of trading boats having been sunk by them almost instantaneously. They are more frequent in the eastern than the western part of Bengal, and happen oftener towards the close of the day than at any other time; but as they are indicated some time before they approach by the rising and singular appearance of the clouds, the traveller has commonly time enough to seek for a place of shelter. It is in the great rivers alone that they are so formidable, and that about the end of May or beginning of June, when the rivers are much increased in width. After the commencement of the rainy season, which varies in different parts from the middle to the end of June, tempestuous weather occasionally happens. At this season places of shelter are more common than at any other time by the filling up of the creeks and inlets as the river increases: and on the other hand, the bad weather, when it happens, is of longer continuance than during the season of the north-westers. The rivers being now spread to the distance of several miles, large waves are raised on them, particularly when blowing in a direction contrary to the rapid parts of the stream, which for obvious reasons ought to be avoided.

This navigation is performed in safety during the interval between the end of the rainy season and the beginning of the north-westers; an ordinary degree of attention being then only requisite to pilot the boat clear of shallows and stumps of trees. The season of the north-westers requires the greatest care and attention. Should one of these squalls approach, and no creek or inlet offer for shelter, the steep bank of the rivers should be always sought as a place of shelter, if it is not in a crumbling state†, whether it be to the windward or leeward, rather than the other. If this cannot be done, the flat side must be taken up with; and if it be a lee shore the anchor should be thrown out to prevent driving upon it. In these cases the mast

Bengal.

6
Dangerous
effects of
the north-
west winds.

7
Of the in-
land navi-
gation in
Bengal.

† See Gen.

Bengal.

is always supposed to be struck; and, provided this be done, and the cargo judiciously disposed of, there is little danger of any of the boats commonly made use of being overfet.

8
Budgerows,
a kind of
boats, de-
scribed.

The boats used in the inland navigation of Bengal are called *budgeroes*, and are formed somewhat like a pleasure-barge. Some have cabins 14 feet broad and proportionally long, drawing from four to five feet water. Their motion is very slow, not exceeding the rate of eight miles a day when moved by their oars; so that their progress down the river must depend principally on the motion of the current. From the beginning of November to the middle or latter end of May, the usual rate of going down the stream is about 40 miles in twelve hours, and during the rest of the year from 50 to 70 miles. The current is strongest while the waters of the inundation are draining off, which happens in part of August and September. In many of the shallow rivers, however, the current is exceedingly slow during the dry months; insomuch that the track-rope is frequently used in going downwards. In towing against the stream the steep side of the river is generally preferred on account of the depth of water, though the current runs much stronger there than on the opposite side. On these occasions it is necessary to provide a very long track-rope, as well for avoiding the falling pieces of the steep bank on the one side as the shallow water on the other, when it becomes necessary to change sides through the badness of the tracking ground. The anchor should always be kept ready for dropping in case the track-rope breaks. The usual rate of towing against the stream is from 17 to 20 miles a-day; and to make even this progress, the windings of the river require the boats to be dragged against the current at the rate of four miles and an half per hour for 12 hours. When the waters are high, a greater progress will be made, notwithstanding the superior strength of the current; because the filling of the river-bed gives many opportunities of cutting off angles and turnings, and sometimes even large windings, by going through creeks.

9
Account of
a dreadful
famine in
1770.

Bengal produces the vegetables and animals common to other countries in the torrid zone. Its great produce of grain is rice, which is commonly exported from thence into other countries. By various accidents, however, the crop of rice sometimes fails, and a famine is produced; and of this there have been many instances in Bengal as well as in other parts of Indostan. One of the most deplorable of this kind happened in the year 1770. The nabob and several great men of the country distributed rice *gratis* to the poor until their stocks began to fail, when those donations were of consequence withdrawn. Vast multitudes then came down to Calcutta, the capital English settlement in the province, in hopes of meeting with relief at that place. The granaries of the Company, however, being quite empty, none could be afforded; so that when the famine had prevailed a fortnight, many thousands fell down in the streets and fields; whose bodies, mangled by the dogs and vultures, corrupting in the air, seemed to threaten a plague as the consequence of the famine. An hundred people were daily employed on the Company's account, with doolys, sledges, and bearers, to throw them into the river. At this time the fish could not be eaten, the river be-

ing so full of carcases; and many of those who ventured to feed upon them died suddenly. Hogs, ducks, and geese, also fed mostly on carnage; so that the only meat that could be procured was mutton; and this, from the dryness of the season, was so small, that a quarter of it would scarcely weigh a pound and an half.

In the month of August a most alarming phenomenon appeared, of a large black cloud at a distance in the air, which sometimes obscured the sun, and seemed to extend a great way over and about Calcutta. The hotter the day proved the lower this cloud seemed to descend, and for three days it occasioned great speculation. The bramins pretended, that this phenomenon, which was a cloud of insects, should make its appearance three times; and if ever they descended to the earth, the country would be destroyed by some untimely misfortune. They said, that about 150 years before there had been such another bad time, when the earth was parched for want of water; and this cloud of insects made its appearance, though it came much lower the second time than it had done before. On the third day, the weather being very hot and cloudy, they descended so low that they could be plainly seen. They seemed to be about the size of a horse-finger, with a long red body, large head and eyes, keeping close together like a swarm of bees, and, to appearance, flying quite on a line. None, however, were caught, as the people were so much frightened by the prognostications of the bramins. Whilst it rained they continued in one position for near a quarter of an hour; then they rose five or six feet at once, and in a little time descended as much, until a strong north-west wind blew for two days successively. During its continuance they ascended and descended, but more precipitately than before; and next morning the air was quite clear. For some days before the cloud made its appearance, the toads, frogs, and insects, which during the rains make a continual noise through the night, disappeared, and were neither heard nor seen, except in the river.

This dreadful famine was occasioned by a preternatural drought. In this country they have two harvests, one in April, called the *little harvest*, which consists of the smaller grain; the second, called the *grand harvest*, is only of rice. But by a drought which happened in 1769 the great harvest of that year failed, as did also the little one of 1770, which produced the dreadful consequences already mentioned.

Among the vegetables produced in Bengal Mr Ives mentions the areca tree, the woody part of which is as tough as whalebone. Here is also a beautiful tree called *chulta*, the flower of which is at first a hard green ball on footstalks about four inches in length. This opens, and the calyx is composed of five round thick and succulent leaves; the corolla consists of the like number of fine beautiful white petals. After one day the corolla falls off and the ball closes again, and is sold in the markets. There is a succession of these for several months. The mango tree grows here also in plenty. Its fruit is preferred to all others in the country excepting very fine pine-apples; the gentlemen eat little else in the hot months when these fruits are in season. If no wine is drunk with them they are apt to produce boils which are troublesome but healthful.

Bengal. healthful. In the walks of Bengal they have a tall tree called the *tatoon*, said to have been first brought into England by Captain Birch. The leaves are of a deep shining green, the lower part rather paler where it is ribbed, and undulated round the edges. The fruit is of the size, shape, and colour of an olive, with a moderately thin husk, and a kernel like that of the date; five or six grow on the same pedicle. Near Calcutta is a large spreading tree called the *russa*, which makes a fine appearance when in full bloom. The natives say that this and another near the Dutch settlement are the only two in Bengal. They pretend likewise that they can never find the seed; but Mr Ives informs us that this is to be met with in plenty, though in a bad condition, the ants and other vermin being so fond of them, that not a single pod is ever to be met with that is not touched by one or other of these species of insects. This tree bears flowers of bright crimson, and all the shades from thence down to a bright yellow. They are in such plenty as almost to cover the tree, but have little or no smell. The fruit is a pod of the shape and size of a large garden-bean, containing four or five fleshy seeds, which easily fall into two when dry. They are brown on the outside, white within, and nearly square, but convex on the sides.

13
Birds of an
extraordi-
nary size.

Among the animals to be met with in Bengal Mr Ives makes mention of a kind of birds named *argill* or *burgill* (see *ARDEA*, sp. 6.). They are very large, and in the evenings would majestically stalk along like as many naked Indians, for which our author at first mistook them. On discovering that they were birds he resolved to shoot one of them; which, however, was very difficult to be done. The Indians showed evident marks of dissatisfaction at the attempt; and informed him that it was impossible to succeed, because these birds were possessed by the souls of bramins. At last, however, he succeeded; and informs that the bird he shot extended 14 feet 10 inches between the tips of the wings; from the tip of the bill to the extremity of the claw was seven feet and a half: the legs were naked, as was also one-half of the thighs; the naked parts being three feet in length. The feathers of the wings and back were of an iron colour, and very strong; those of the belly were very long, and on the breast was a great deal of down all of a dirty white. The bill was 16 inches round at the base, nearly of a triangular shape, and of different colours. In the craw was a land-tortoise 10 inches long; and a large black male cat was found entire in its stomach.

14
Commerce
inland.

Bengal is reckoned the richest and most populous province in the empire of Indostan. Besides its own consumption, which is certainly very considerable, its exports are immense. One part of its merchandise is carried into the inland country. Thibet takes off a quantity of its cottons, besides some iron and cloths of European manufacture. The inhabitants of those mountains fetch them from Patan themselves, and give musk and rhubarb in exchange.

But the trade of Thibet is nothing in comparison of that which Bengal carries on with Agra, Delhi, and the provinces adjacent to those superb capitals, in salt, sugar, opium, silk, silk-stuffs, and an infinite quantity of cottons, and particularly muslins. These articles, taken together, amounted formerly to more than L.1,750,000 a-year. So considerable a sum was

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not conveyed to the banks of the Ganges; but it was the means of retaining one nearly equal, which must have issued from thence to pay the duties, or for other purposes. Since the viceroys of the Mogul have made themselves nearly independent, and send him no revenues but such as they choose to allow him, the luxury of the court is greatly abated, and the trade we have been speaking of is no longer so considerable.

The maritime trade of Bengal, managed by the natives of the country, has not suffered the same diminution, nor was it ever so extensive, as the other. It may be divided into two branches, of which Catek is in possession of the greater part.

Catek is a district of some extent, a little below the most western mouth of the Ganges. Balasore, situated upon a navigable river, serves it for a port. The navigation to the Maldives, which the English and French have been obliged to abandon on account of the climate, is carried on entirely from this road. Here they load their vessels with rice, coarse cottons, and some silk stuffs, for these islands; and receive cowries in exchange, which are used for money in Bengal, and sold to the Europeans.

The inhabitants of Catek, and some other people of the Lower Ganges, maintain a considerable correspondence with the country of Asham. This kingdom, which is thought to have formerly made a part of Bengal, and is only divided from it by a river that falls into the Ganges, deserves to be better known, if what is asserted here be true, that gun-powder has been discovered there, and that it was communicated from Asham to Pegu, and from Pegu to China. Its gold, silver, iron, and lead mines, would have added to its fame, if they had been properly worked. In the midst of these riches, which were of very little service to this kingdom, salt was an article of which the inhabitants were so much in want, that they were reduced to the expedient of procuring it from a decoction of certain plants.

In the beginning of the present century, some Bramins of Bengal carried their superstitions to Asham, where the people were guided solely by the dictates of natural religion. The priests persuaded them, that it would be more agreeable to Brama if they substituted the pure and wholesome salt of the sea to that which they used. The sovereign consented to this on condition that the exclusive trade should be in his hands; that it should only be brought by the people of Bengal; and that the boats laden with it should stop at the frontiers of his dominions. Thus have all these false religions been introduced by the influence and for the advantage of the priests who teach, and of the kings who admit them. Since this arrangement has taken place, 40 vessels from 500 to 600 tons burden each are annually sent from the Ganges to Asham laden with salt, which yields 200 per cent. profit. They receive in payment a small quantity of gold and silver, ivory, musk, eagle-wood, gum-lac, and a large quantity of silk.

Excepting these two branches of maritime trade, which, for particular reasons, have been confined to the natives of the country, all the rest of the vessels sent from the Ganges to the different sea-ports of India belong to the Europeans, and are built at Pegu. See *PEGU*.

Y

A

Bengal.

15

Maritime.

Bengal.

A still more considerable branch of commerce, which the Europeans at Bengal carry on with the rest of India, is that of opium. Patna, situated on the Upper Ganges, is the most celebrated place in the world for the cultivation of opium. The fields are covered with it. Besides what is carried into the inland parts, there are annually 3000 or 4000 chests exported, each weighing 300 pounds. It sells upon the spot at the rate of between 24l. and 25l. a chest on an average. This opium is not purified like that of Syria and Persia, which we make use of in Europe; it is only a paste that has undergone no preparation, and has not a tenth part of the virtue of purified opium.

The Dutch send rice and sugar from their settlements to the coast of Coromandel, for which they are paid in specie, unless they have the good fortune to meet with some foreign merchandise at a cheap rate. They send out one or two vessels laden with rice, cottons, and silk: the rice is sold in Ceylon, the cottons at Malabar, and the silk at Surat; from whence they bring back cotton, which is usually employed in the coarser manufactures of Bengal. Two or three ships laden with rice, gum-lac, and cotton stuffs, are sent to Baffora; and return with dried fruits, rose-water, and a quantity of gold. The rich merchandise carried to Arabia is paid for entirely in gold and silver. The trade of the Ganges with the other sea-ports of India brings 1,225,000l. annually into Bengal.

Though this trade passes through the hands of the Europeans, and is carried on under their protection, it is not entirely on their own account. The Moguls, indeed, who are usually satisfied with the places they hold under the government, have seldom any concern in these expeditions; but the Armenians, who, since the revolutions in Persia, are settled upon the banks of the Ganges, to which they formerly only made voyages, readily throw their capitals into this trade. The Indians employ still larger sums in it. The impossibility of enjoying their fortunes under an oppressive government does not deter the natives of this country from labouring incessantly to encrease them. As they would run too great a risk by engaging openly in trade, they are obliged to have recourse to clandestine methods. As soon as an European arrives, the Gentoos, who know mankind better than is commonly supposed, study his character; and, if they find him frugal, active, and well informed, offer to act as his brokers and cashiers, and lend or procure him money upon bottomry, or at interest. This interest, which is usually nine *per cent.* at least, is higher when he is under a necessity of borrowing of the Cheyks.

16
Gentoo
brokers.

17
Cheyks, a
powerful
Indian fa-
mily.

These Cheyks are a powerful family of Indians, who have, time immemorial, inhabited the banks of the Ganges. Their riches have long ago procured them the management of the bank belonging to the court, the farming of the public revenue, and the direction of the money, which they coin afresh every year in order to receive annually the benefit arising from the mint. By uniting so many advantages, they are enabled to lend the government 1,750,000l. 2,625,000l. or even 4,375,000l. at a time. When the government finds it impossible to refund the money, they are allowed to indemnify themselves by oppressing the people.

The Europeans who frequent the Ganges have not

been sufficiently alarmed at this despotism, which ought to have prevented them from submitting to a dependence upon the Cheyks. They have fallen into the snare, by borrowing considerable sums of these avaricious financiers, apparently at nine, but in reality at thirteen, *per cent.* if we take into the account the difference between the money that is lent them and that in which they are obliged to make their payments. The engagements entered into by the French and Dutch companies have been kept within some bounds; but those of the English company have been unlimited. In 1755, they were indebted to the Cheyks about 1,225,000l.

The Portuguese, who first frequented this rich country, had the wisdom to establish themselves at Chatigan, a port situated upon the frontier of Arracan, not far from the most eastern part of the Ganges. The Dutch, who, without incurring the resentment of an enemy at that time so formidable, were desirous of sharing in their good fortune, were engaged in searching for a port which, without obstructing their plan, would expose them the least to hostilities. In 1653, their attention was directed to Balasore; and all the companies, rather through imitation than in consequence of any well-concerted schemes, followed their example. Experience taught them the propriety of fixing as near as possible to the markets from whence they had their merchandise; and they sailed up that branch of the Ganges which, separating itself from the main river at Mourcha above Cassimbuzar, falls into the sea near Balasore under the name of the river *Hughly*. The government of the country permitted them to erect warehouses wherever there was plenty of manufactures, and to fortify themselves upon this river.

The first town that is met with in passing up the river is Calcutta, the principal settlement of the English company. See CALCUTTA. 18
Principal towns.

Six leagues higher is situated Frederic Nagore, founded by the Danes in 1756, in order to supply the place of an ancient settlement where they could not maintain their ground. This new establishment has not yet acquired any importance, and there is all the reason imaginable to believe that it will never become considerable.

Two leagues and an half higher lies Chandernagore, a settlement belonging to the French. See CHANDERNAGORE.

At the distance of a mile from Chandernagore is Chinsura, better known by the name of *Doughi*, being situated near the suburbs of the anciently renowned city. The Dutch have no other possessions there, but merely their fort; the territory round it depending on the government of the country, which hath frequently made it feel its power by its extortions. Another inconvenience attending this settlement is a sandbank that prevents ships from coming up to it: they proceed no farther than Tulta, which is 20 miles below Calcutta; and this of course occasions an additional expence to the government.

The Portuguese had formerly made Bandel, which is eighty leagues from the mouth of the Ganges, and a quarter of a league above the Hughly, the principal seat of their commerce. Their flag is still displayed, and there are a few unhappy wretches remaining there, who have forgotten their country after having been

Bengal
Benhinom
19
Exports.

forgotten by it. This factory has no other employment than that of supplying the Moors and the Dutch with mistresses.

The exports from Bengal to Europe consist of musk, gum-lac, nicaragua wood, pepper, cowries, and some other articles of less importance brought thither from other places. Those that are the immediate produce of the country are borax, salt-petre, silk stuffs, muslins, and several different sorts of cottons.

It would be a tedious and useless task to enumerate all the places where ticken and cottons, fit for table-linen or intended to be worn plain, painted, or printed, are manufactured. It will be sufficient to refer to DACCA, which may be looked upon as the general mart of Bengal, where the greatest variety of finest cottons are to be met with, and in the greatest abundance. See DACCA.

The sum total of the purchases made in Bengal by the European nations, amounted a few years ago to no more than 870,000 l. One third of this sum was paid in iron, lead, copper, woollens, and Dutch spices: the remainder was discharged in money. Since the English have made themselves masters of this rich country, its exports have been increased, and its imports diminished, because the conquerors have carried away a greater quantity of merchandise, and pay for it out of the revenues they receive from the country. There is reason to believe, that this revolution in the trade of Bengal has not arrived at its crisis, and that sooner or later it will be attended with more important consequences and effects.

For the history of Bengal, and its conquests by the British, see the article INDOSTAN.

BENGO, a province of the kingdom of Angola in Africa, having the sea on the west, and the province of Mofesche on the east. It produces plenty of banana trees; but the Portuguese have grubbed up vast quantities of these, and cultivated the land, which now abounds with maize, and the manioc root of which they make bread*. The province is divided into a great number of districts, of which the chiefs are natives, but tributary to Portugal, and obliged to till the lands belonging to the Portuguese. They are Christians, and have eight churches.

BENGUELA, a province of the kingdom of Angola in Africa, bounded on the east by the river Rimba, on the north by the Coanza, and it extends westward quite to Cape Negro. Benguela was formerly governed by its own kings; but was entirely ruined by the incursions of the barbarous Giagas, so that its being conquered by the Portuguese proved a great happiness. It still retains the title of *kingdom*, and is allowed to enjoy some small privileges; but is far from being restored to the state of plenty it enjoyed before its destruction by the Giagas already mentioned. It produces abundance of salt, but inferior in quality to that which is made in the province of Chissama. The zimbis also, whose shells are current as money through many countries of Africa, are caught upon the coast. The country, which is mostly mountainous, abounds with elephants, rhinoceroses, lions, tigers, crocodiles, &c. which are very dangerous, and destroy great numbers of cattle.

BENHINNOM (anc geog.), a valley in the suburbs, and to the east of Jerusalem, either a part of or

conjoined with the valley of Kidron, (Joshua); infamous for sacrificing children, or passing them through the fire. The place in the valley where the idol stood to which the sacrifice was made, was called *Tophet*, (2 Kings xxiii. 10. Jer. vii. 31, 32. and xix. 2.), from beating drums or tabours to drown the cries or shrieks of the children: called also *Geenon* or the *Valley of Ennon*: whence some derive *Gehenna*, the place of future punishment.

BENJAMIN. See BENZOIN and STYRAX.

BENIARAX, an ancient and considerable town in the kingdom of Algiers in Africa, seated in W. Long. 0. 30. N. Lat. 35. 0.

BENIN, a country of Guinea, in Africa, has part of the gulph called the *Bite of Benin*, and the Slave Coast, on the west; part of Gago and Biafara on the north; Myjac and Makoko on the east; and Congo on the south, where it extends about one degree beyond the equinoctial line; the length from east to west is about 600 miles; but its north and south bounds are not so well determined. The land in general is low and woody; in some parts it has rivers and lakes, but in others there is a scarcity of water. There are here a great number of wild beasts, particularly elephants, lions, tygers, leopards, baboons, monkeys, wild boars, deer, &c. The birds are partridges, of which some are blue and some green, turtles, wild ducks, woodcocks, &c. Their grain is Indian corn: they have no potatoes; but plenty of yams, which are of the potato kind, but vastly larger and more coarse: these are their ordinary food, and serve in the room of bread; they have two sorts of beans, like horse-beans, but not near so good. Their fruits are cocoa-nuts, cormantine apples, bananas, wild figs, &c.

The negroes have several colours which might serve for painting and a good sort of soap made with palm-oil and wood-ashes; they have a great deal of cotton, which not only serves for their own use, but is exported to distant places. The river Rio or Benin has a great many arms; some of which are so large, that they deserve the name of rivers: it abounds with fish, which the inhabitants eat smoke-dried as well as fresh. The place of trade in this river is at Arebo, about 120 miles distant from its mouth; and to this place the ships may sail up. Those who take this voyage see the mouths of a great many rivers fall into the principal channel to the right and the left; but how far it ascends into the country is not known. A little higher up, the country is very low and marshy, and seems to be divided into islands; and yet there are trees of all sizes growing on the banks; this renders the country very unhealthy, as many of our British sailors have found to their cost; it is also incommoded with vast numbers of flies, called *mosquitoes*, which sting terribly, and render the skin full of pustules. There are three principal villages to which the negroes come from the inland countries to traffic. One is called *Boodadou*, and consists of about 50 houses, or rather huts, for they are made with reeds and covered with leaves. The second, called *Arebo*, was mentioned above: this is much larger than the former, and pretty well stocked with inhabitants; and the houses have much more room, but they are built after the same manner. The third has the name of *Agaton*, and was built upon a hill. It was almost ruined by the wars; but the negroes lately rebuilt it, on account of its agreeable

Benjamin
Benin.

* See *Jatropha*.

Benin.

agreeable situation. Great Benin is the place of residence of the king.

The inhabitants of Benin are very exact in their trading, and will not recede from any of their old customs: this renders them very slow in their dealings, and backward to pay their debts, which sometimes obliges the traders to sail before they receive satisfaction; but then they are paid as soon as they return. Some of the merchants are appointed by the government, which demands a sort of custom; but it is very trifling. There are three sorts of officers under the king; the first are always near him, and none can address him but by their means: there are several of the second sort; one takes care of the slaves, another of the cattle, another of the streets, another of war, and so on.

Children go almost naked till they are 14, and then they wrap a cotton cloth round their middles; the richer sort put on a sort of callico gowns when they go abroad, with a kind of drawers; but within they are contented with their usual cloth: the better sort of women wear their cotton cloths like petticoats, and have a covering round their shoulders, but take care it shall be open before.

The richer sort of the inhabitants of Benin live upon beef, mutton, and poultry; their drink is water, and brandy when they can get it. The poorer sort live upon dried fish, bananas, and beans; their drink is water and palm-wine. Their chief handicraft men are smiths, carpenters, and curriers; but they perform all their work in a very bungling manner. The men have as many wives as they can keep, which they take without any ceremony except treating their relations. The wives of the lower sort may go wherever they have a mind; but those of the rich are shut up: they allow their wives to be very familiar with the Europeans, and yet pretend to be very jealous of their own countrymen. When a woman is caught in adultery, she is turned away, and the goods of the man are forfeited to the husband; but if the relations of the woman are rich, they prevail with him to overlook the fault by dint of presents.

They use circumcision, which is performed seven days after the children are born, at which time the father makes a feast for the relations; they have also customs, relating to uncleanness, resembling those of the Jews. Thieves are punished by making the party amends if they can, otherwise they are bastinadoed; but murder is always punished with death. When a person is only suspected of a crime, they have several ways of putting him to a trial, like the fire ordeal, or the bitter water of the Jews; but they are of such a nature, that the innocent may be as often condemned as the guilty.

With regard to their religion, they believe in an almighty and invisible God; yet worship images in a human form, and in those of all sorts of animals, making them offerings, every one being his own priest: they look upon these lesser deities as mediators between him and man; some of these idols are in the house and some in cabins by themselves. Every fifth day is holy; on which the rich kill cows, sheep, and goats, and others dogs, cats, and fowls, which they distribute among their poor neighbours.

BENIN, the capital of a kingdom of the same name,

is the residence of their kings, and is seated pretty far in the country: it stands in a plain, and is about four miles in compass. The streets are long and broad; and there are markets twice a-day, where they sell cows, cotton, elephants teeth, European merchandizes, and whatever the country produces. The houses are large with clay walls, and at a distance from each other; they are covered with reeds, straw, and leaves. The women in this place are the greatest slaves; for they go every day to market, manage the household affairs, take care of the children, cook the victuals, and till the ground. The king's palace makes great part of the town; and its great extent excepted, there is nothing worth taking notice of, it being only a confused heap of buildings, made with boards and clay, without regularity or neatness. In the middle, there is a wooden tower, about 70 feet high, made like a chimney; and on the top is a brazen serpent, hanging with his head downwards; this is pretty well made, and is the most curious thing in the town: there is a gallery of statues, but so wretchedly carved, that there is no knowing what they represent without being told: behind a curtain there are 11 brazen heads, with an elephant's tooth on each; these are the king's idols: his throne is made of ivory, on which he sits in a pavilion of India stuff. The king shows himself but once a-year, on the day of a certain festival; and then he is surrounded with his wives and a great number of his officers, who walk out in procession to begin the feast by sacrificing to their gods; this done, he bestows victuals and wine among the multitude, which is imitated by his officers. All the inhabitants of this town and country go under the denomination of the king's slaves; and some relations say, that none of them wear any habit till given them by the king: but this seems to be only a salvo to account for the great number of men and women that are daily seen naked in the streets; for if it be true, that the king of Benin can bring 100,000 fighting men into the field, his subjects must be very numerous; and probably his majesty is not rich enough to bestow garments upon them all. The Europeans resort hither to purchase slaves. E. Long. 5. 4. N. Lat. 7. 40.

BENISH-DAYS, among the Egyptians, a term for three days of the week, which are days of less ceremony in religion than the other four, and have their name from the *benish*, a garment of common use, not of ceremony. In Cairo, on Sundays, Tuesdays, and Thursdays, they go to the bashaw's divan; and these are the general days of business. Fridays they stay at home, and go to their mosques at noon; but though this is their day of devotion, they never abstain from business. The three other days of the week are the benish-days, in which they throw off all business and ceremony, and go to their little summer-houses in the country.

BENNAVENTA, or BENNAVENNA, (Antonine), a town of Britain, on the Aufona Major, or the Antona of Tacitus: supposed to be Northampton on the Nen; but Camden says it is Wedon, a village six miles to the west of Northampton.

BENNET (Henry), earl of Arlington, was born of an ancient family in Middlesex. In the beginning of the civil war, he was appointed under-secretary to George Lord Digby, secretary of state; afterward entered

Benin

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Bennet.

Benin.

tered himself as a volunteer for the royal cause, and did his majesty good service, especially at Andover in Hampshire, where he received several wounds. When the wars were ended, he left not the king when success did, but attended his interest in foreign parts. He was made secretary to the duke of York; received the honour of knighthood from Charles II. at Bruges, in 1658: and was sent envoy to the court of Spain. His majesty, upon his return to England, called him home, made him keeper of his privy purse, and principal secretary of state. He had always a peculiar hatred to the lord chancellor Hyde; who on the other hand considered him as a concealed Papist. In 1670 he was one of the council distinguished by the title of the *Cabal*, and one of those who advised shutting up the exchequer. In 1672 he was made Earl of Arlington and Viscount Thetford, and soon after Knight of the Garter. In 1673, he was appointed one of the three plenipotentiaries from the court of Great Britain to Cologne, to mediate a peace between the emperor and the king of France. The House of Commons, in 1673, drew up articles of impeachment against him. In 1674 he was made chamberlain of his majesty's household, with this public reason, that it was in recompence of his long and faithful service, and particularly for his having performed the office of principal secretary of state for the space of 12 years, to his majesty's great satisfaction. But afterward his interest began to decline, while that of the earl of Danby increased; for upon his return from his unsuccessful journey to Holland in 1675, his credit was so much sunk, that several persons at court diverted the king with mimicking his person and behaviour; yet he held his lord chamberlain's place to the day of his death in 1685. His esteemed letters to Sir William Temple were published after his death.

BENNET (Christopher), an eminent physician in the 16th century, was the son of John Bennet, of Raynton, in Somersetshire. He was educated at Lincoln college, Oxford; and gave the public a treatise on consumptions, intitled, *Theatri Tabidorum Vestibulum*, &c. also *Exercitationes Diagnosticae, cum Historiis demonstrativis, quibus Alimentorum et Sanguinis vitia deteguntur in plerisque morbis*, &c.

BENNET (Dr Thomas), an eminent divine, born at Salisbury on the 7th of May 1673, and educated at St John's college, Cambridge. In 1700, he was made rector of St James's, in Colchester; afterwards he was lecturer of St Olave's, Southwark, and morning-preacher at St Lawrence, Jewry; and at last was presented to the vicarage of St Giles's, Cripple-gate, worth 500 l. a-year. While he was in this station, he was engaged in several expensive law-suits in defence of the rights of the church, to which he recovered 150 l. a-year. He wrote, 1. An Answer to the Dissenter's Plea for Separation. 2. A Confutation of Popery. 3. A Discourse of Schism. 4. An Answer to a book intitled Thomas against Bennet. 5. A Confutation of Quakerism. 6. A brief History of the joint Use of pre-conceived Forms of Prayer. 7. An Answer to Dr Clarke's Scripture-doctrine of the Trinity. 8. A Paraphrase, with Annotations, on the Book of Common-Prayer. 7. An Hebrew Grammar; and other pieces. He died October 9th, 1728, in the 56th year of his age.

Benoit,
Benferade.

BENOIT (Renatus), a famous doctor of the Sorbonne, and curate of Eustathius at Paris in the 16th century. He was a secret favourer of the Protestant religion; and that his countrymen might be able to read the bible in their own tongue, he published at Paris the French translation, which had been made by the reformed ministers at Geneva. This translation was approved of by several doctors of the Sorbonne before it went to the press, and king Charles IX. had granted a privilege for the printing of it. Yet when it was published, it was immediately condemned. He had been before that time confessor to the unhappy Mary queen of Scotland, during her stay in France, and attended her when she returned into Scotland. Some time before the death of Henry III. Dr Benoit, or some of his friends with his assistance, published a book, intitled, *Apologie Catholique*, i. e. The Catholic Apology; in which it was showed, that the Protestant religion, which Henry king of Navarre professed, was not a sufficient reason to deprive him of his right of succeeding to the crown of France. When Henry IV. was resolved to embrace the Catholic religion, he assisted at that assembly in which king Henry abjured the reformed religion. The king promoted him to the bishoprick of Troyes in Champagne 1597, but he could never obtain the pope's bulls to be installed. However, he enjoyed the temporalities of that bishopric till he resigned it. He died in 1608.

BENSERADE (Isaac de), an ingenious French poet of the 17th century, was born at Lyons. He made himself known at court by his verses and his wit, and had the good fortune to please the cardinals de Richelieu and Mazarin. After the death of Richelieu, he got into favour with the Duke de Breze, whom he accompanied in most of his expeditions; and when this nobleman died, he returned to court, where his poetry became highly esteemed. He wrote, 1. A Paraphrase upon Job. 2. Verses for Interludes. 3. Rondeaux upon Ovid. 4. Several Tragedies. A sonnet which he sent to a young lady with his Paraphrase on Job being put in competition with the Urania of Voiture, caused him to be much spoken of; for what an honour was it to be head of a party against this celebrated author? Those who gave the preference to Benferade's performance were styled the *Jobists*, and their antagonists the *Uranists*; and the dispute long divided the whole court and the wits. Some years before his death, he applied himself to works of piety, and translated almost all the Psalms.

M. L'Abbé Olivet says, that Benferade towards the latter end of his life, withdrew from court, and made Gentilly the place of his retirement. When he was a youth, he says it was the custom to visit the remains of the ornaments with which Benferade had embellished his house and gardens, where every thing favoured of his poetical genius. The bark of the trees were full of inscriptions: and, amongst others, he remembers the first which presented itself was as follows:

*Adieu fortune, honneurs adieu, vous et les vôtres,
Je viens ici vous oublier;
Adieu toi-même amour, bien plus que les autres
Difficile à congédier.*

Fortune and honours, all adieu,
And whatsoe'er belongs to you.

Bensheim,
Benson.

I to this retirement run,

All your vanities to shun.

Thou too adieu, O powerful love ;

From thee 'tis hardest to remove.

Mr Voltaire is of opinion that these inscriptions were the best of his productions, and he regrets that they have not been collected.

Benferade suffered at last so much from the stone, that, notwithstanding his great age, he resolved to submit to the operation of cutting. But his constancy was not put to this last proof; for a surgeon letting him blood, by way of precaution pricked an artery, and, instead of endeavouring to stop the effusion of blood, ran away. There was but just time to call F. Commire, his friend and confessor, who came soon enough to see him die. This happened the 19th of October 1691, in the 82d year of his age.

BENSHEIM, a town of Germany in the Palatine of the Rhine, seated in E. Long. 8. 45. N. Lat. 52. 23.

BENSON (Dr George), a learned dissenting minister, born at Great Salkeld, in Cumberland, in 1699. His love of learning was so successful, that, at 11 years of age, he was able to read the Greek Testament. He afterwards studied at Dr Dixon's academy at Whitehaven, from whence he removed to the university of Glasgow. In 1721, he was chosen pastor of a congregation of Dissenters at Abingdon in Berkshire; in 1729, he received a call from a society of dissenters in Southwark, with whom he continued 11 years; and in 1740, was chosen by the congregation of Crutched Friars, colleague to the learned and judicious Dr Lardner. From the time of his engaging in the ministry he proposed to himself the critical study of the Scriptures, particularly of the New Testament, as a principal part of his business. The first fruits of these studies which he presented to the public was, A Defence of the reasonableness of Prayer, with a Translation of a Discourse of Maximus Tyrius containing some popular Objections against Prayer, and an Answer to these. The light which Mr Locke had thrown on the obscurest parts of St Paul's epistles, by making him his own expositor, encouraged and determined Mr Benson to attempt to illustrate the remaining epistles in the same manner. In 1731, he published A Paraphrase and Notes on the Epistle to Philemon, as a specimen. This was well received, and the author encouraged to proceed in his design. With the epistle to Philemon was published "A short dissertation, to prove from the spirit and sentiments the apostle discovered in his epistles, that he was neither an enthusiast nor impostor; and consequently that the religion which he asserted he received immediately from heaven, and confirmed by a variety of miracles, is indeed divine." This argument hath since been improved and illustrated, with great delicacy and strength, in a review of the apostle's entire conduct and character by Lord Littleton. Mr Benson proceeded with great diligence and reputation to publish Paraphrases and Notes on the two Epistles to the Thessalonians, the first and second to Timothy, and the Epistle to Titus; adding, Dissertations on several important Subjects, particularly on Inspiration. In the year 1735, our author published his History of the first Planting of Christianity, taken from the Acts of the Apostles, and their Epistles, in 2 vols 4to. In this work, besides illustrating throughout the history of the Acts and most

of the epistles, by a view of the history of the times, the occasion of the several epistles, and the state of the churches to whom they were addressed, he established the truth of the Christian religion on a number of facts, the most public, important, and incontestable. He also wrote, The reasonableness of the Christian Religion; The History of the Life of Jesus Christ; A Paraphrase and Notes on the seven Catholic Epistles; and several other works which procured him great reputation. One of the universities in Scotland sent him a diploma with a doctor's degree; and many of high rank in the church of England, as Herring, Hoadley, Butler, Benson, Coneybear, &c. showed him great marks of favour and regard. He pursued the same studies with great application and success till the time of his death, which happened in the year 1763, in the 64th year of his age.

BENTHAM (Thomas), bishop of Litchfield and Coventry, was born at Shirburn in Yorkshire in the year 1513, and educated in Magdalene college Oxford. He took the degree of bachelor of arts in 1543, and in 1546 was admitted perpetual fellow, and proceeded master of arts the year following, which was that of Edward VI.'s accession to the crown. He now threw off the mask of Popery, which during the equivocal reign of Henry VIII. he had worn with reluctance. When Mary came to the crown, being deprived of his fellowship by her visitors, he prudently retired to Basil in Switzerland, where for some time he expounded the Scriptures to the English exiles in that city; but, being solicited by some Protestants in London, he returned to London before the death of the Queen, and was appointed superintendant of a private congregation in the city. Immediately on the accession of Elizabeth, Bentham was preferred in the church, and in the second year of her reign was consecrated bishop of Litchfield and Coventry. He died at Eccleshal in Staffordshire in 1570, aged 65. He was buried in the chancel of the church there; and a monument was erected, with the effigy of himself, his wife, and four children, with the following inscription:

*Hac jacet in tumba Benthamus, episcopus ille
Doctus, divinus, largus, pascens, pius, almus.
Ob. 19. Feb. 1578.*

Bishop Bentham had the character of a pious and zealous reformer, and was particularly celebrated for his knowledge of the Hebrew language. His works are, 1. Exposition of the Acts of the Apostles; manuscript. 2. A Sermon on Christ's Temptation; Lond. 8vo. 3. Epistle to M. Parker; manuscript. 4. The Psalms, Ezekiel, and Daniel, translated into English in Queen Elizabeth's Bible.

BENTIVOGLIO (Guy), cardinal, born at Ferrara, in the year 1579. He went to study at Padua, where he made a considerable proficiency in polite literature. Upon his leaving the university, he went to reside at Rome, where he became universally esteemed. He was sent nuncio to Flanders, and then to France; in both which employments his behaviour was such as gave great satisfaction to Paul V. who made him a cardinal, which was the last promotion he made, a little before his death, which happened on the 28th of January 1621. Bentivoglio was at this time in France, where Louis XIII. and all the French court congratulated him

Bentham,
Bentivoglio.

Bentivoglio,
Bentley.

him on his new dignity; and when he returned to Rome, his Christian majesty entrusted him with the management of the French affairs at that court. Pope Urban VII. had a high regard for him on account of his fidelity, disinterestedness, and consummate knowledge in business. He was beloved by the people, and esteemed by the cardinals; and his qualities were such, that in all probability he would have been raised to the pontificate on the death of Urban, which happened on the 29th of July 1644; but having gone to the conclave during the time of the most intolerable heats at Rome, it affected his body to such a degree, that he could not sleep for 11 nights afterwards; and this want of rest threw him into a fever, of which he died the 7th of September 1644, aged 65. He has left several works; the most remarkable of which are, A History of the Civil Wars of Flanders, An Account of Flanders, with Letters and Memoirs.

BENTIVOGLIO, a small town of Italy in the territory of Bologna, with a castle, situated in E. Long. 11. 34. N. Lat. 44. 47.

BENTLEY (Richard), an eminent critic and divine, was born at Oulton, in the parish of Rothwell, near Wakefield. His ancestors, who were of some consideration, possessed an estate, and had a seat at Hepenstall, in the parish of Hallifax. His grandfather James Bentley was a captain in King Charles I.'s army at the time of the civil wars; and being involved in the fate of his party, had his house plundered, his estate confiscated, and was himself carried prisoner to Pomfret Castle, where he died. Thomas Bentley, the son of James, and father of Dr Bentley, married the daughter of Richard Willis of Oulton, who had been a major in the royal army. This lady, who was a woman of exceeding good understanding, taught her son Richard his accidence. To his grandfather Willis, who was left his guardian, he was in part indebted for his education; and having gone through the grammar school at Wakefield with singular reputation, both for his proficiency and his exact and regular behaviour, he was admitted of St John's college Cambridge, under the tuition of Mr Johnson, on the 24th of May 1676; being then only four months above 14 years of age. On the 22d of March 1681-2, he stood candidate for a fellowship, and would have been unanimously elected, had he not been excluded by the statutes on account of his being too young for priest's orders. He was then a junior bachelor, and but little more than 19 years old. It was soon after this that he became a schoolmaster at Spalding. But that he did not continue long in this situation is certain from a letter of his grandfather Willis's, still preserved in the family, from which it appears, that he was with Dr Stillingfleet at the Deanery of St Paul's on the 25th of April 1683. He had been recommended by his college to the dean as preceptor to his son; and Dr Stillingfleet gave Mr Bentley his choice whether he would carry his pupil to Cambridge or Oxford. He fixed upon the latter university on account of the Bodleian library, to the consulting of the manuscripts of which he applied with the closest attention. Being now of age, he made over a small estate which he derived from his family to his elder brother, and immediately laid out the money he obtained for it in the purchase of books. In July 1683, he took the degree of Master of Arts at St

John's college Cambridge. In 1692, his patron being advanced to the see of Worcester, collated him to a prebend in that church, and also made him his domestic chaplain. That learned prelate, as well as Dr Will. Lloyd, then bishop of Litchfield, had seen many proofs of our author's extraordinary merit, when they concurred in recommending him as a fit person to open the lectures upon Mr Boyle's foundation, in defence of natural and revealed religion. This gave him a fine opportunity of establishing his fame. He saw it well; and resolved to push it to the utmost. Sir Isaac Newton's *Principia* had been published but a few years, and the book was little known and less understood. Mr Bentley therefore determined to spare no pains in displaying to the best advantage the profound demonstrations which that excellent work furnished in proof of a Deity; and that nothing might be wanting to complete the design, he applied to the author, and received from him the solution of some difficulties which had not fallen within the plan of his treatise*. In short, our author's sermons at Boyle's lectures were universally admired, and highly raised his reputation as a preacher; notwithstanding that escape which laid him open to the raillery of Dr Kiel, viz. of proving the moon not to turn round her axis because she always shows the same face to the earth. In 1693, he was made keeper of the royal library at St James's.

In the following year arose the famous dispute between him and the honourable Mr Boyle, in relation to the epistles of Phalaris; of which Mr Boyle had published a very fine edition, with a Latin version of the text. These epistles the Dr asserted to be spurious, the production of some sophist, and altogether contemptible as a literary performance. The principal pieces which appeared in this noted controversy were, 1. Dr Bentley's dissertation upon the epistles of Themistocles, Socrates, Euripedes, Phalaris, and the Fables of Æsop, at the end of the second edition of Mr Wotton's *Reflections on Ancient and Modern Learning*: but afterwards printed by Dr Bentley entire, and added with great additions to his farther defence of it, in answer to Mr Boyle. 2. "Dr Bentley's Dissertation on the Epistles of Phalaris and the Fables of Æsop examined by the Honourable Charles Boyle, Esq;" a book more commonly known by the title of *Boyle against Bentley*. 3. Dr Bentley's Answer to the above, commonly known by the name of *Bentley against Boyle*; a curious piece, interspersed with a great deal of true wit and humour. From the caprice or partiality of the age the victory was adjudged to Mr Boyle, and the ridicule of the wits exercised upon Dr Bentley. Thus Dr Garth, in the Dispensary,

So Diamonds take a lustre from their foil,

And to a BENTLEY 'tis we owe a BOYLE.

Dr Bentley had also some wags who were his enemies even at Cambridge, who drew his picture in the hands of Phalaris's guards, who were putting him into their master's bull, and out of the Doctor's mouth came a label with these words, *I had rather be ROASTED than BOYLED*. And Dean Swift, in his *Tale of a Tub*, had some strokes at Dr Bentley upon this occasion, but more especially in his *Battle of the Books*, where, on account of Dr Bentley's dissertation of Phalaris, &c. being annexed to Mr Wotton's reflections on learning, and

Bentley.

* Vid. Four Letters from Sir Isaac Newton to Dr Bentley, Lond. 1756.

Bentley. and their being great friends, he makes Mr Wotton and Dr Bentley, standing side by side, in each other's defence, to be both transfix'd to the ground by one stroke of the javelin of Mr Boyle, and this he heightens by the simile of a cook's spitting a brace of woodcocks. Nay, so strong is the influence of literary prejudice and fashion, that many even of Dr Bentley's friends considered Boyle's Examination as unanswerable. Nor could they be convinced of the contrary, till the Doctor, first asking them where it was so impregnable, and confuting one article after another upon the spot, as fast as they instanced, assured them it was all of the same kind. This he effectually showed in his answer. It now, however, seems to be the settled opinion of the literary world, that the Doctor has not only the evident advantage in respect of learning and argument, but that he is little, if at all, inferior to his antagonist in point of wit and smartness. It may not, however, be amiss to recite a few testimonies on the subject. Mr Walpole, speaking of Mr Boyle's translation of the Epistles of Phalaris, says, "This work occasioned the famous controversy with Dr Bentley;—who alone, and unworsted, sustained the attacks of the brightest genius's in the learned world, and whose fame has not suffered by the wit to which it gave occasion." Mr Towers, in his British Biography, expresses himself in the following terms: "In the controversy between him and Mr Boyle, the popular clamour, indeed, was in favour of the latter; but Bentley's is unquestionably a much more valuable performance than that of Boyle. The latter, considered as a mere English composition, has the advantage in point of style; and pleased the generality, by the personal satire which it contained against Dr Bentley, who had many enemies. But Bentley had greatly the superiority with respect to just reasoning, critical sagacity, and extent of learning; and his vindication of himself also contained many shrewd and sarcastical strokes against Mr Boyle and his performance. Much has been said in favour of Mr Boyle, as a genteel and polite writer; and it must be confessed, that Dr Bentley's manner was often too assuming, and that he was deficient in point of civility. But notwithstanding this, there was, perhaps, a much greater want of real candour and politeness, whatever affectation of them there might be, in the very contemptuous and unfair manner in which Dr Bentley was treated throughout Mr Boyle's book, than in any thing which Bentley had said against Boyle. Bentley, with all his foibles, was too respectable a character to be a proper subject of such treatment; though Swift, Garth, and Pope, have joined in countenancing the popular prejudices against him." Mr Dodwell, who resided at Oxford during the controversy, who made himself in some sort a party in it, and who had a very particular court paid to him by the Christ-Church men, declared to them that he never learned so much from any book of the size in his life, as he had done from Dr Bentley's Answer to Boyle.

In 1696, at the public commencement, Mr Bentley had been created Doctor of Divinity by the university of Cambridge; and some time thereafter admitted, *ad eundem*, in the university of Oxford.

In 1700 he was presented to the mastership of Trinity college, Cambridge, which is reckoned worth near

1000 l. *per annum*. Upon this promotion he resigned his prebend of Worcester; and, in 1701, was collated to the archdeaconry of Ely. Being thus placed in a state of ease and affluence, he entered into matrimony, and indulged his inclination in critical pursuits; and the fruits of his labours, which he occasionally published, all displayed such erudition and sagacity, that, by degrees, he obtained the character of being the greatest critic of the age. In the mean while, however, he carried matters with so high a hand in the government of his college, that, in 1709, a complaint was brought before the bishop of Ely, as visitor, against him, by several of the fellows, who charged him with embezzling the college money, and other misdemeanors. In answer to this, he presented his defence to the bishop, which he published in 1710, under the title of *The present State of Trinity College*, 8vo; and thus began a quarrel, which was carried on with the most virulent animosity on each side, for above 20 years, when it at last ended in the Doctor's favour. In 1716, upon the death of Dr James, he was appointed regius professor of divinity in the former university; annexed to which was a good benefice in the bishopric of Ely. His Majesty King George I. on a visit to the university in 1717, having, as usual, nominated by mandate several persons for a doctor's degree in divinity, our professor, to whose office it belonged to perform the ceremony called *creation*, demanded four guineas from each person, besides a broad piece of gold, and absolutely refused to create any doctor without these fees: hence there arose a long and warm dispute, during which, the doctor was first suspended, and then degraded; but on a petition to his Majesty for relief from that sentence, the affair was referred to the Court of King's Bench, where the proceedings against him being reversed, a mandamus was issued, charging the university to restore him.—With regard to Dr Bentley's long dispute with his college, Mr Whiston represents his having been induced in a single instance, after four years of unexceptionable conduct, to recede from the excellent rule of *detur digniori*, in the election to a fellowship, as the first false step which led to others, and was very prejudicial to his own happiness. A concise and accurate account of his controversies with his college and the university, and of the publications which appeared on these occasions, may be seen in Mr Gough's anecdotes of topography. There are likewise, in the Harleian collection of manuscripts in the British Museum, N^o 7523, some authentic papers, relative to the proceedings of the university against Dr Bentley.—Dr Bentley was endowed with a natural hardness of temper, which enabled him to ride out both these storms without any extraordinary disturbance, or interruption to his literary pursuits. In his private character, tho' he is generally allowed to have been too fond of money, he was hearty, sincere, and warm in his friendship, an affectionate husband, and a most indulgent father. He loved hospitality and respect; maintained the dignity and munificence of the ancient abbots in house-keeping at his lodge, which he beautified; and, in conversation, tempered the severity of the critic with such a peculiar strain of vivacity and pleasantry, as was very entertaining. He died at his lodge in Trinity college, on the 14th of July 1742, at 80 years of age. To his latest hour, he could read the smallest Greek Testament

Bentley.

flament without spectacles; and he died of a young man's disorder, a pleuretic fever. He was of a large and robust frame of body, and of strong features. These gave a dignity, perhaps a severity, to his aspect, which probably heightened the opinion many had conceived of the haughtiness and roughness of his temper. But, in fact, he was of so tender a disposition, that he never read a touching story without tears. It was not, indeed, till after he had been afflicted with a slight paralytic stroke, that this particular effect of the softness of his nature was in every case apparent; so that it may possibly be imputed, in some degree, to his disorder. It is, however, certain, that previous to that event, he was endued with great tenderness and sensibility. In the contest about the visitatorial power, when he met Bishop Moore, he was so struck with seeing his old friend appear in a hostile manner against him, that he fainted away in the court.

When we consider the great abilities and uncommon erudition of which Dr Bentley was possessed, it reflects some disgrace on our country, says Dr Kippis, that even his literary reputation should be so long treated with contempt; that he should be represented as a mere verbal critic, and as a pedant without genius. The unjust light in which he was placed, was not entirely owing to the able men who opposed him in the Boylean controversy; it arose, perhaps, principally from the poets engaging on the same side of the question, and making him the object of their satire and ridicule. The "flashing Bentley" of Pope will be remembered and repeated by thousands who know nothing of the Doctor's real merit. Having mentioned this epithet, we shall add the candid note of the poet's right reverend editor. "This great man, with all his faults, deserved to be put into better company. The following words of Cicero describe him not amiss: *"Habuit a natura genus quoddam acuminis, quod etiam arte limaverat, quod erat in reprehendis verbis versutum et solers; sed sæpe stomachosum, nonnunquam frigidum, interdum etiam facetum."* In the fourth book of the Dunciad, Mr Pope introduces our critic at greater length, and with still greater severity. Perhaps it may be found, that the asperity of Mr Pope was not entirely owing to the combination of certain wits and poets against Dr Bentley, but to personal resentment. We are told that Bishop Atterbury, having Bentley and Pope both at dinner with him, insisted on knowing what opinion the Doctor entertained of the English Homer. He for some time eluded the question: but at last, being urged to speak out, he said, "The verses are good verses; but the work is not Homer, it is Spondanus." It must, indeed, be acknowledged, that one cause of Dr Bentley's having enemies, was his not always bearing his faculties with sufficient meekness. He appears to have had a considerable degree of literary pride, and to have spoken of himself and others with uncommon freedom. Mr Whiston informs us of the Doctor's having said, "That when he himself should be dead, Wasse would be the most learned man in England." Dr Salter, who was extremely devoted to the memory of Dr Bentley, confessed that he was remarkable for his *fastus*, especially towards his equals, and for speaking highly of himself. But at the same time, he is described by Dr Salter as having been a very amiable and pleasant man in private life, and as

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possessing much good nature, though he had been otherwise represented. This account agrees with the most authentic information from different quarters. It is related of Dr Bentley, that he used to pull off his hat to the younger students, but would not do it to the fellows of his college. Being asked the reason for making this difference, he answered, "That the young ones might come to something; but for the others, they never could be good for any thing."

The Doctor's principal works, besides those already mentioned, were, 1. Animadversions and remarks on the poet Callimachus. 2. Annotations on the two first Comedies of Aristophanes. 3. Emendations, &c. on the Fragment of Menander and Philemon. 4. Remarks upon Collins's discourse of Free-thinking. 5. Beautiful and correct editions of Horace, Terence, Phædrus, and Milton, with notes.

In 1721 he published Proposals for printing a new edition of the Greek Testament, and St Hierom's Latin version; in which edition he intended to make no use of any manuscript that was not at least 1000 years old. Upon these proposals Dr Middleton published some remarks; and the work never made its appearance. "If Dr Middleton's attack contributed to this event (Dr Kippis observes), he certainly did no little disservice to the cause of sacred literature. The completion of Dr Bentley's noble undertaking was the principal employment of the latter part of his life. He had collected and collated all the manuscripts of Europe to which access could be obtained. For this purpose, his nephew Thomas Bentley, LL. D. well known in the republic of letters, travelled through Europe at his uncle's expence. The work was of such magnitude, that he found it necessary, for the first time, to publish proposals for printing it by subscription. The whole was completed for publication; and he had received 2000 l. in part of the subscription, all of which he returned to the subscribers when he took the resolution of not letting it appear in the world during his own life. The work is now in the possession of his executor Dr Richard Bentley, one of the senior fellows of Trinity college, and rector of Nailston near Ashby in Leicestershire; and it is hoped that at some future period it may yet see the light.—Other valuable remains of Dr Bentley are still in existence; some of which are in the hands of his executor, and some in those of Mr Cumberland his grandson. The latter gentleman is possessed of the Doctor's classic books, with his marginal notes. From these notes Mr Cumberland hath published an edition of Lucan; which though not perfect throughout, is full and complete with regard to the four first books. The same gentleman has a Homer of our great critic's, with many marginal notes and corrections, preparatory to an edition of it which he intended to have given. Dr Bentley's critical correspondence with his numerous literary acquaintance, which must be very instructive and entertaining, is not only preserved, but designed to be laid before the public."

The Doctor's publication of Milton, it is said, was owing to Queen Caroline. Her Majesty represented to him that he had printed no edition of an English classic, and urged him to undertake Milton. His notes upon this great poet have been the worst received of any of his critical performances. The learned Bishop

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Newton

Bentley.

Benzoin
||
Berberis.

Newton speaks of them with considerable severity, intermixed, however, with some applause.

BENZOIN, in materia medica, a concrete resinous juice, obtained from a species of *styrax*. See *STYRAX*.

BERAMS, a coarse cloth, all made with cotton-thread, which comes from the East Indies, and particularly from Surat.

BERAR, a province of Asia, in the dominions of the Great Mogul, near the kingdom of Bengal. It abounds in corn, rice, pulse, and poppies, from which last they extract opium; and sugar-canes grow almost without cultivation. The capital town is called *Sbopour*.

BERAUM, a royal city of Bohemia, and capital of a circle of the same name. E. Long. 14. 25. N. Lat. 50. 2.

BERAY, a town of Normandy in France, situated in W. Long. 1. 20. N. Lat. 49. 6.

BERBERIS, the *BARBERRY*, or *pipperidge bush*: A genus of the monogynia order, belonging to the hexandria class of plants; the characters of which are: The calyx consists of six leaves; the petals are six, with two glands at the unguis; it has no stylus; and the berry contains two seeds.

Species. 1. The vulgaris, or common barberry, grows naturally in hedges in many parts of England, as also in some parts of Scotland: but is also cultivated in gardens on account of its fruit, which is pickled and used for garnishing dishes. It rises to the height of eight or ten feet, with many stalks, which have a white bark, yellow on the inside. The stalks and branches are armed with sharp thorns, which commonly grow by threes; the leaves are oval, obtuse, and slightly sawed on their edges. The flowers come out from the wings of the leaves in small ramose bunches, like those of the currant bush, and are of a yellow colour; these are succeeded by oval fruit, which are at first green, but when ripe turn to a fine red colour. The flowers appear in May, and the fruit ripens in September. There are two or three varieties of this shrub, which by some have been taken for distinct species; one is the barberry without stone; another, the barberry with white fruit; and a third is called by Tournefort *taller eastern barberry*, with a black sweet fruit. Of these Mr Miller observes, that the first certainly depends on the age of the plant; because the suckers taken from those bushes commonly produce fruit with stones: the second, he says, seldom bears any fruit; the leaves are of a lighter green colour, and the bark of the stalks are whiter than those of the common kind: the third appears to be the same with the common sort, excepting the colour and flavour of its fruit, which can never indicate a specific difference. 2. The canadensis, is a native of that country from whence it takes its name, and was formerly much more common in British gardens than at present. The leaves are much broader and shorter than those of the common sort, and the fruit is black when ripe. 3. The cretica, with a single flower in each footstalk, is at present very rare in Britain; the plants being tender whilst young, and most of them killed by severe frost. This never rises more than three or four feet high in Britain; but sends out many stalks from the root, which are strongly armed with spines at every joint: the leaves are produced without order, and are shaped like those of the narrow-leaved box-tree: the flowers come out from between the leaves,

each having a slender footstalk; but they are not succeeded by fruit in Britain.

Culture. The first sort is generally propagated by suckers, which are sent out in great plenty from the root; but such plants are very apt to send out suckers in greater plenty than those that are propagated by layers; so the latter method is preferable. The best time for laying down the branches is in the autumn, when the leaves begin to fall: the young shoots of the same year are the best for this purpose; these will be well rooted by the next autumn, when they may be taken off, and planted where they are designed to remain. Where this plant is cultivated for its fruit, it should be planted single, not in hedges as was formerly the practice; the suckers should be every autumn taken away, and the gross shoots pruned out: by this means the fruit will be much fairer and in greater plenty than on those that are suffered to grow wild. The other sorts may be propagated in the same manner; only the third should be planted in pots, and sheltered as soon as the young shoots are taken off, till the plants have acquired strength, when they may be turned out, and planted in a warm situation.

Medicinal and other qualities. The berries, which are so acid that birds will not feed upon them, are moderately astringent; and have been given with success in bilious fluxes, and diseases proceeding from heat, acrimony, and thinness of the juices. Among the Egyptians barberries are used in fluxes and in malignant fevers, for abating heat, quenching thirst, raising the strength, and preventing putrefaction: the fruit is macerated for a day and a night, in about 12 times its quantity of water, with the addition of a little fennel seed, or the like, to prevent offence to the stomach; the liquor strained off, and sweetened with sugar or syrup of citrons, is given the patient liberally to drink. Prosper Alpinus, from whose treatise *De Medicina Egyptorum* Dr Lewis extracted this account; informs us, that he took this medicine himself with happy success, in a pestilential fever accompanied with an immoderate bilious diarrhoea. The leaves also are gratefully acid. The flowers are offensive to the smell when near, but at a distance their odour is extremely fine. An infusion of the bark in white-wine is purgative. The roots boiled in ley dye wool yellow. In Poland they dye leather of a most beautiful yellow with the bark of the root. The inner bark of the stems dyes linen of a fine yellow with the assistance of alum. This shrub should never be permitted to grow in corn lands; for the ears of wheat that grow near it never fill, and its influence in this respect has been known to extend across a field of 300 or 400 yards. Cows, sheep, and goats, eat it; horses and swine refuse it.

BERBICE, a river of Terra Firma in America, which falls into the North Sea, in S. Lat. 6. 30. This is the only river in the country, and waters a great number of plantations of cotton, &c. belonging to the Dutch.

BERCARIA, **BERQUERIA**, or *Berkeria*, in middle-age writers, denotes a sheep-fold, sheep-cote, sheep-pen, or other inclosure, for the safe keeping a flock of sheep.—The word is abbreviated from *berbicaria*; of *berbex*, detorted from *vervex*. Hence also a shepherd was denominated *berbicarius* and *berquarius*.

BERCHEROIT, or **BERKOITS**, a weight used at Archangel, and in all the Russian dominions, to weigh such

Berberis
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Bercaria.

Berchem such merchandizes as are heavy and bulky. It weighs about 364 lb. English averdupois weight.

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Berengarianism.

BERCHEM, or **BERGHEM**, (Nicholas), an excellent painter, was a native of Haerlem, and born in 1624. He received instructions from several very eminent masters; and it was no small addition to their fame that Berchem was their scholar. The charming pictures of cattle and figures by this admirable master are justly held in the highest estimation. He has been singularly happy in having many of them finely engraved by John VISSCHER, an artist of the first rank. Berchem had an easy expeditious manner of painting, and an inexpressible variety and beauty in the choice of sites for his landscapes; executing them with a surprising degree of neatness and truth. He possessed a clearness and strength of judgment, and a wonderful power and ease in expressing his ideas; and although his subjects were of the lower kind, yet his choice of nature was judicious, and he gave to every subject as much of beauty and elegance as it would admit. The leafing of his trees is exquisitely and freely touched; his skies are clear; and his clouds float lightly, as if supported by air. The distinguishing characters of the pictures of Berchem are, the breadth and just distribution of the lights; the grandeur of his masses of light and shadow; the natural ease and simplicity in the attitudes of his figures, expressing their several characters; the just degradation of his distances; the brilliancy and harmony, as well as the transparency, of his colouring; the correctness and true perspective of his design; and the elegance of his composition; and where any of those marks are wanting, no authority ought to be sufficient to ascribe any picture to him. He painted every part of his subjects so extremely well, as to render it difficult to determine in which he excelled most; his trees, buildings, waters, rocks, hills, cattle, and figures, being all equally admirable.

BERCHETT (Peter), an eminent history-painter, was born in France in 1659, and at the age of 18 was employed in the royal palaces. He came to England in 1681, to work under Rambour, a French painter of architecture; but, after staying a year, returned to Marli. He came again, and was sent by king William to the palace he was building at Loo, where he was employed 15 months; and then came a third time to England, where he had sufficient business. We are informed by Mr Walpole, that he then painted the ceiling of the chapel of Trinity college, Oxford, the staircase at the Duke of Schomberg's in Pall-mall, and the summer-house at Ranelagh. His drawings in the academy were much approved. Towards the close of his life he retired to Mary-bone, where he painted only small pieces of fabulous history, and died there in January 1720.

BERDASH, in antiquity, was a name formerly used in England for a certain kind of neck-dress; and hence a person who made or sold such neck-cloths was called a *berdasher*, from which is derived our word *berdasher*.

BERECYNTHIA, the mother of the gods, in the Pagan theology.

BERENGARIANISM, a name given by ecclesiastical writers to the opinion of those who deny the truth and reality of the body and blood of Christ in the eucharist. The denomination took its rise from Berengarius, archdeacon and scholiasticus of the church

of St Mary at Anjou about the year 1035, who maintained, that the bread and wine, even after consecration, do not become the true body and blood of our Lord, but only a figure and sign thereof.

Berenice.

Berengarianism was strenuously opposed by Lanfranc, Guitmond, Adelmannus, Albericus, &c. Divers synods were held, wherein the author was condemned at Rome, Versailles, Florence, Tours, &c. He retracted, and returned again more than once; signed three several Catholic confessions of faith; the first in the second council of Rome, the second in the third, and the third in the fourth council of the same city. But he still relapsed to his former opinion when the storm was over; though Mabillon maintains he soon recovered from his fourth fall, and died an orthodox Catholic in 1088.

BERENICE, daughter of Ptolemy Auletes king of Egypt, succeeded her father before his death. This banished prince implored the assistance of the Romans. Pompey restored him. Berenice, to support herself on the throne, allured a prince, whose name was Seleucus, descended from the kings of Syria, and admitted him to her nuptial bed, and to her sceptre. She was soon weary of him, and put him to death. She next cast her eye on Archelaus, who married her, and put himself at the head of her troops to repulse the Romans. He was killed in a battle. Ptolemy returned to Alexandria and put his rebellious daughter to death.

BERENICE, wife of Ptolemy Evergetes king of Egypt, cut off her hair in pursuance of a vow, and consecrated it in the temple of Venus. This deposit being afterwards lost, Connon the mathematician, in compliment to her, declared that the queen's locks had been conveyed to heaven, and composed those seven stars near the tail of the bull, called to this day *coma Berenices*.

BERENICE, daughter of Costobarus and of Salome sister to Herod the Great, was married first to Aristobulus, son of the same Herod and Mariamne. He having a brother who married the daughter of Archelaus king of Cappadocia, often upbraided Berenice that he was married below himself in wedding her. Berenice related all these discourses to her mother, and exasperated her so furiously, that Salome, who had much power over Herod's mind, made him suspect Aristobulus, and was the principal cause that urged this cruel father to get rid of him. She married again; and having lost her second husband, went to Rome, and got into the favour of Augustus. But, above all, she insinuated herself into the good graces of Antonia, the wife of Drusus, which in the end proved of great service to Agrippa.

BERENICE, grand-daughter of the preceding, and daughter of Agrippa I. king of Judea, has been much talked of on account of her amours. She was betrothed to one Marcus, but he died before the marriage. Soon after, she married his uncle Herod, who at the desire of Agrippa, both his brother and father-in-law, was created king of Chalcis by the emperor Claudius. She lost her husband in the eight year of the emperor Claudius; and in her widowhood, it was rumoured she committed incest with her brother Agrippa. To put a stop to this report, she offered herself in marriage to Polemon king of Cilicia, provided he would change his religion. He accepted her offers, was circumcised, and married her. Berenice soon left him to follow her

Berenice
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Berg.

own ways, and he abandoned Judaism to return to his former religion. She was always very well with her brother Agrippa, and seconded him in the design of preventing the desolation of the Jews. She got Titus into her snares; but the murmurs of the Roman people hindering her from becoming his wife, there remained nothing for her but the title of mistress or concubine of the emperor. The French stage, in the 17th century, refounded with the amours of Titus and Berenice.

BERENICE (anc. geog.), the name of several cities, particularly of a celebrated port-town on the Sinus Arabicus: Now *Suez*; which see.

BERENICE's Hair, *Coma Berenices*. See BERENICE.

BERE-REGIS, a town in Dorsetshire in England, in W. Long. 2. 15. N. Lat. 50. 40.

BERESOW, a division of the province of Tobolsk in Siberia. It is bounded on the north by the straits of Waigatz, on the east by a large bay of the frozen ocean, which runs into the land towards the south, and at the 65th degree of latitude separates into two arms; one of which is called the *Obyskaia-Guba* or *Oby-bay*; and the other *Tazowskaia-Guba*, or the bay of *Tazow*. The river Oby empties itself into the former, and the Taz into the latter. This district was under the Russian dominion long before the other parts of Siberia were conquered, being reduced by the Czar Gabriel so early as the year 1530.

BEREWICHA, or BEREWICA, in our old writers, denotes a village or hamlet belonging to some town or manor, situated at some distance therefrom.—The word frequently occurs in Doomsday-book: *Iste sunt berewiche ejusdem manerii*.

BERG, a duchy of Germany, in the circle of Westphalia. It is bounded on the north by the duchy of Cleves, on the west by the county of Mark and the duchy of Westphalia, on the south by Westeravia, and on the east by the diocese of Cologne, from which it is separated by the Rhine. It is about 150 miles in length, and 24 in breadth. It is very fruitful along the Rhine, but mountainous and woody towards the county of Mark. It is subject to the elector Palatine, but his right is disputed by Prussia and Saxony. The principal town is Dusseldorp; and the principal rivers, besides the Rhine, are the Wipper, Agger, and Sieg.

BERG (St Winox), a town of the Low Countries, in the country of Flanders, fortified by Vauban, and subject to France. It is seated on the river Colme, six miles from Dunkirk, and 21 from Ypres. The air is often very unwholesome, especially to strangers. It has an hospital for soldiers, taken care of by friars called *Bons Fieux*, and two seminaries for young students. The river Colme serves instead of a canal to go to Hondshot, St Omer's, and Gravelines. There is likewise another canal to go to Dunkirk. The villages in its territory are very famous for butter and cheese, of which they send a great quantity to Flanders. Fort Lapin and Fort Suisse are within a cannon's shot of this place, and Fort St Francis is seated on the canal, near three miles from the town. E. Long. 2. 35. N. Lat. 50. 57.

BERG-ZABERN, a town of France in Alsace. E. Long. 7. 55. N. Lat. 49. 4.

BERG-Gruin, in natural history, the name of an earth used in painting, and properly called *green okre*, though not known among the colour-men under that name. It is found in many parts of Germany, Italy, and Eng-

land, commonly in the neighbourhood of copper-mines, from particles of which metal it receives its colour. In many parts of Germany, they have a purer kind of this, distinguished by no peculiar name, but separated by art from the waters draining from the copper-mines, and differing no otherwise from this native substance, than as the washed okres of Oxfordshire, &c. do from these sent us in their natural condition. The characters by which the native kind is known from other green earths, are these: it is a dense compact substance, considerably heavy, and of a pale but not disagreeable green; of a rough and uneven, but not dusty surface, and somewhat unctuous to the touch. It adheres firmly to the tongue; does not break easily between the fingers; nor at all stains the hands. It is of a brackish disagreeable taste, and does not ferment with acids.

BERGAMASCO, a province of Italy, in the territory of Venice. It is bounded on the east by the Bressan, on the north by the Valteline, on the west and south by the Milanese. It extends about 36 leagues from north to south, and 30 from east to west. It is watered by several rivers which render it very fertile, and particularly it produces a great number of chestnuts. It has mines of iron, and quarries of marble, and other stones of which they make millstones. There are a great number of villages, but no city except Bergamo the capital. The people are very industrious, and make the best of their natural productions. They are well stocked with cattle, and make fine tapestry. Their language is the most corrupt of any in Italy.

BERGAMO (James Philip de), an Augustin monk, born at Bergamo in 1434, wrote in Latin a Chronicle from the creation of the world to the year 1503, and a Treatise of Illustrious Women. He died in 1518.

BERGAMO, anciently *Bergomum*, a large and strong town of Italy, in the Venetian territory, and capital of the province of Bergamasco. It has a strong citadel, and is the see of a bishop. Its situation near the Alps makes the inhabitants subject to swellings in their throats, owing to the badness of the Alpine waters. E. Long. 9. 38. N. Lat. 45. 42.

BERGAMOT, a species of citron, produced at first casually by an Italian's grafting a citron on the stock of a bergamot pear-tree, whence the fruit produced by this union participated both of the citron-tree and the pear-tree. The fruit hath a fine taste and smell, and its essential oil is in high esteem as a perfume. The essence of Bergamot is also called *essentia de cedra*. It is extracted from the yellow rind of the fruit by first cutting it in small pieces, then immediately squeezing the oil out of them into a glass vessel. This liquor is an etherial oil. A water is distilled from the peel as follows: Take the outer rind of three bergamots, a gallon of pure proof-spirit, and four pints of pure water; draw off a gallon in a balneum marie, then add as much of the best white sugar as will be agreeable. Or take of the essence of bergamot three drams and a half, of rectified spirit of wine three pints, of volatile sal ammoniac a dram; distil off three pints in a balneum marie.

BERGAMOT is also the denomination of a coarse tapestry, manufactured with flocks of silk, wool, cotton, hemp, ox, cow, or goat's hair, and supposed to be invented by the people of Bergamo in Italy.

BERGARAC, a very rich, populous, and trading town

Bergamasco
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Bergarac.

Bergas || town of France, seated on the river Dordogne, in E. Long. 0. 37. N. Lat. 50. 57.

Bergman. BERGAS, a town of Romania in European Turkey, and the see of a Greek archbishop. It is seated on the river Larissa, in E. Long. 27. 30. N. Lat. 41. 17.

BERGEN, anciently *Bergi*, a city of Norway, and capital of the province of Bergenhus. It is the see of a bishop, and has a strong castle and a good port. It is a large place; but is subject to fires, as being all built of wood. It is surrounded with mountains almost inaccessible; and little or no corn grows in all the country; that which they use is all imported, and distributed from thence throughout the kingdom. The principal trade is in stock-fish, firs, and deal-boards. E. Long. 5. 45. N. Lat. 60. 11.

BERGEN, a town of Pomerania in Germany, and capital of the Isle of Rugen, subject to the Swedes. E. Long. 13. 0. N. Lat. 54. 30.

BERGEN-OP-ZOOM, a town of the Low Countries, in Dutch Brabant, and in the marquissate of the same name. It is seated on an eminence, in the middle of a morass, about a mile and a half from the eastern branch of the Scheld, with which it has a communication by a navigable canal. The houses are well built, and the market-places and squares handsome and spacious. The church before the last siege was reckoned a good building, and so was the marquis's palace. It has a good tract of land under its jurisdiction, with several villages, and some islands in the Scheld. It has a very advantageous situation on the confines of Brabant, Holland, Zealand, and Flanders. It is strong by nature as well as by art, being so secured by the morasses about it, which are formed by the river Zoom, that it was reckoned impregnable. It was, however, taken in 1747 by the French, but it is thought not without the help of treachery. The fortifications are allowed to be the master-piece of that great engineer Cohorn. It had been twice besieged before without success. The marquis of Spinola was the last but one who invested it, and he was forced to raise the siege with the loss of 10,000 men. E. Long. 4. 15. N. Lat. 51. 30.

BERGHEM. See BERCHEM.

BERGHMONT, an assembly or court held upon a hill in Derbyshire, for deciding controversies among the miners.

BERGMAN (Sir Torbern), a celebrated chemist and natural philosopher, was born in the year 1735 at Catharineberg in Westgothland. His father was receiver-general of the finances, and had destined him to the same employment; but nature had designed him for the sciences. To them he perceived an irresistible inclination from his earliest years, and nature proved more powerful than the will of his friends. His first studies were confined to mathematics and physics: and the efforts that were made to divert him from science having proved ineffectual, he was sent to Upsal with permission to follow the bent of his inclination. Linnæus at that time filled the whole kingdom with his fame. Instigated by his example, the Swedish youth flocked around him: and accomplished disciples leaving his school, carried the name and the system of their master to the most distant parts of the globe. Bergman was struck with the splendor of this renown; he attached himself to the man whose merit had procured it, and by whom he was very soon distinguished. He

applied himself at first to the study of insects, and made several ingenious researches into their history; among others into that of the genus of *tenthredo*, so often and so cruelly preyed on by the larvæ of the ichneumons, that nestle in their bowels and devour them. He discovered that the leech is oviparous; and that the cocculus aquaticus is the egg of this animal, from whence issue ten or twelve young. Linnæus, who had at first denied this fact, was struck with astonishment when he saw it proved. *Vidi et obstupui!* were the words he pronounced, and which he wrote at the foot of the memoir when he gave it his sanction. Mr Bergman soon distinguished himself as an astronomer, naturalist, and geometrician; but these are not the titles by which he acquired his fame. The chair of chemistry and mineralogy which had been filled by the celebrated Wallerius, becoming vacant by his resignation, Mr Bergman was among the number of the competitors: and without having before this period discovered any particular attention to chemistry, he published a memoir on the preparation of alum that astonished his friends as well as his adversaries. Nobody was able to conceive how in so short a time he could have made a course of experiments so complete, on a subject so new to him. His dissertation was warmly attacked in the periodical publications, and Wallerius himself criticised without reserve. But in the midst of so many enemies, he possessed a firm friend. The prince Gustavus, now king of Sweden, and then chancellor of the university, took cognizance of the affair. After having consulted two persons, the most able to give him advice, and whose testimony went in favour of Bergman, he addressed a memorial, written with his own hand, in answer to all the grievances alledged against the candidate, to the consistory of the university and to the senate, who confirmed the wishes of his Royal Highness.

Mr Bergman had now a hard duty to fulfil: he had to satisfy the hopes that were conceived of him; to fill the place of Wallerius; and to put envy to silence. He did not follow the common tract in the study of chemistry. As he had received the lessons of no master, he was tainted with the prejudices of no school. Accustomed to precision, and having no time to lose, he applied himself to experiments without paying any attention to theories: he repeated those often which he considered as the most important and instructive, and reduced them to method; an improvement till then unknown. He first introduced into chemistry the process by analysis, which ought to be applied to every science; for there should be but one method of teaching and learning, as there is but one of judging well. These views have been laid down by Mr Bergman in an excellent discourse, which contains, if we may say so, his profession of faith in what relates to the sciences. It is here that he displays himself without disguise to his reader; and here it is of importance to study him with attention. The productions of volcanoes had never been analysed when Messrs Ferber and Troil brought a rich collection of these into Sweden. At the sight of them Mr Bergman conceived the design of investigating their nature. He examined first of all the matters least altered by the fire, and the forms of which were still to be discerned: he followed them in their changes progressively; he determined, he imitated their more complicated appearances;

Bergman.

Bergman
Berings.

pearances; he knew the effects which would result from the mixture and decomposition of the saline substances which are found abundantly in these productions. He discovered such as were formed in the humid way; and then in his laboratory he observed the process of nature; that combat of flames and explosions; that chaos in which the elements seem to clash and to confound one another, unveiled themselves to his eyes. He saw the fire of volcanoes kindled in the midst of pyritical combinations, and sea-salt decomposed by clays; he saw fixed air disengaged from calcined calcareous stones, spreading upon the surface of the earth, and filling caverns in which flame and animal life are equally extinguished; he saw the sulphureous acid thrown out in waves, convert itself into the vitriolic by mere contact with the air; and distilling thro' the rocks, form the alum veins of the solfatara. He saw the bitumens as they melted; the inflammable and sulphureous airs exhaling; and the waters become mineral and impregnated with the fire and vapours of these stupendous furnaces, preparing for the beings that move and dispute on the crust of the abyss, a remedy for pain and a balsam for disease.

The continual application which Mr Bergman bestowed on his studies having affected his health, he was advised to interrupt them if he wished to prolong his life: but he found happiness only in study, and wished not to forfeit his title to reputation by a few years more of inactivity and languor. He exhausted his strength, and died in the month of June in the year 1784. The university of Upsal paid the most distinguished honours to his memory; and the academy of Stockholm consecrated to him a medal to perpetuate the regret of all the learned in Europe for his loss. His Physical and Chemical Essays have been collected and translated by Dr Edmund Cullen, and published in 2 vols 8vo.

BERGOMUM (anc. geog.), a town of the Transpadana, built by the Gauls on their incursions into Italy. Now called *Bergamo*, in the territory of Venice. E. Long. 10. N. Lat. 45 40.

BERIA, BERIE, *Berry*, signifies a large open field; and those cities and towns in England which end with that word are built on plain and open places, and do not derive their names from boroughs as Sir Henry Spelman imagines. Most of our glossographers in the names of places have confounded the word *berie* with that of *bury* and *borough*, as if the appellative of ancient towns; whereas the true sense of the word *berie*, is a flat wide campaign, as is proved from sufficient authorities by the learned Du Fresne, who observes that *Beria Sancti Edmundi*, mentioned by Mat. Paris. sub. ann. 1174, is not to be taken for the town, but for the adjoining plain. To this may be added, that many flat and wide meads, and other open grounds, are called by the name of *beries* and *bery-fields*; the spacious meadow between Oxford and Islay was in the reign of king Athelstan called *Bery*; as is now the largest pasture-ground in Quarendon in the county of Buckingham, known by the name of *Beryfield*. And though these meads have been interpreted demesne or manor meadows, yet they were truly any flat or open meadows that lay adjoining to any villa or farm,

BERING (Sinus), of Copenhagen, a Latin lyric poet, flourished about 1560.

BERINGS STRAITS, the name of that narrow di-

vision of the Old and New world, where the breadth between Asia and America is only 13 leagues. They are so named from Captain Vitus Bering, a Dane by birth, and employed on the same plan of discovery in these parts as our great countryman Cook was in the late voyage. He was in the service of Peter the Great; who by the strength of an extensive genius, conceiving an opinion of the vicinity of America to his Asiatic dominions, laid down a plan of discovery worthy of so extraordinary a monarch, but died before the attempt was begun; but his spirit survived in his successor. Bering, after a tedious and fatiguing journey through the wilds of Sibiria, arrived in Kamtschatka, attended with the scanty materials for his voyage, the greatest part of which he was obliged to bring with him through a thousand difficulties. He sailed from the river of Kamtschatka on July 15th 1728; and on the 15th of August saw Serdze Kamen, or the heart-shaped rock, a name bestowed on it by the first discoverer.—From Serdze Kamen, to a promontory named by Captain Cook *East Cape*, the land trends south-east. The last is a circular peninsula of high cliffs, projecting far into the sea due east, and joined to the land by a long and very narrow isthmus, in lat. 66. 6. This is the Tschutski Nofs of our navigators, and forms the beginning of the narrow straits or division of the old and new world. The distance between Asia and America in this place, as already mentioned, is only 13 leagues. The country about the cape, and to the north-west of it, was inhabited. About mid-channel are two small islands, named by the Russians the *isles of St Diomedes*; neither of them above three or four leagues in circuit. It is extremely extraordinary that Bering should have sailed through this confined passage, and yet that the object of his mission should have escaped him. His misfortune could only be attributed to the foggy weather, which he must have met with in a region notorious for mists; for he says that he saw land neither to the north nor to the east. Our generous commander, determined to give him every honour his merit could claim, has dignified these with the name of *Bering's Straits*. The depth of these straits is from 12 to 29 or 30 fathoms. The greatest depth is in the middle, which has a slimy bottom; the shallowest parts are near each shore, which consists of sand mixed with bones and shells. The current or tide very inconsiderable, and what there was came from the west. From East Cape the land trends south by west. In lat. 65. 36. in the bay in which Captain Cook had the interview with the Tschutski. Immediately beyond is the bay of St Laurence, about five leagues broad in the entrance and four deep, bounded at the bottom by high land. A little beyond is a large bay, either bounded by low land at the bottom, or so extensive as to have the end invisible. To the south of this are two other bays; and in Lat. 64. 13. Long. 186. 36. is the extreme southern point of the land of the Tschutski. This formerly was called the *Anadirskoi Nofs*. Near it Bering had conversation with eight men, who came off to him in a *baidar* or boat covered with the skins of seals; from which Bering and others have named it the *Tschutski Nofs*.

BERITH, a simple mentioned in Scripture, used for cleaning or taking out spots (Jer. ii. 22.). Some will have it to be the *kali* or salt-wort, from the ashes of which soap is made; and in our version it is rendered

Bering,
Berith,

Berkeley. ed soap: others, after Rudbeck, made it to be the dye of the purple-fish.

BERKELEY (George), the celebrated bishop of Cloyne, was the eldest son of William Berkeley, Esq; of Thomastown in the county of Kilkenny; a cadet of the family of Earl Berkeley of Berkeley castle. At eight years of age he was sent to the school of the Ormond foundation at Kilkenny, from which Swift had a few years before been removed to the university. Before Berkeley had attained his fourteenth year he was admitted a pensioner in Trinity college Dublin, in which whilst B. A. he obtained a Fellowship. Some of his first essays as a writer were published in the Spectator and Guardian, which entertaining works he adorned with many pieces in favour of virtue and religion. His learning and his virtues, his wit and agreeable conversation, made his friendship sought and his acquaintance cultivated by many great and learned men; and among others by the earl of Peterborough, Dr Swift, Dr Arbuthnot, Mr Pope, and Mr Addison. The earl took him as chaplain and secretary of embassy into Italy; and during his absence on that occasion he became senior fellow of his college, and was in 1717 created D. D. by diploma.

Upon his return, his acquaintance among the great was considerably extended; and Lord Burlington, who at Rome had conceived for him a high esteem on account of his skill in architecture, obtained for him, through the duke of Grafton then (1721) lord-lieutenant of Ireland, the king's grant of the deanery of Down, worth L. 2000 *per annum*. Such however was the narrow system of politics at that time prevalent in the Irish cabinet, that though his majesty had actually signed the grant, the lords justices recommended back for the deanery of Down Swift's Dean Daniel, celebrated for having in a state sermon styled Pompey an *unfortunate gentleman*; and such was Dr Berkeley's humility and mildness of temper, that he could not be prevailed upon to dispute the matter, or even to expostulate on the subject. His patron Lord Burlington procured for him afterwards (1724) the deanery of Derry, the next best in Ireland to that of Down; and upon this preferment the Doctor resigned his fellowship.

In the year 1722 his fortune received a considerable increase from an event by him very unexpected. Upon his first going to London (1717) he sent one morning a note to Swift, desiring that they might dine together that day at a tavern. The dean of St Patrick's returned for answer, that they might enjoy one another's company at their ease where he himself was engaged to dine, with the family of Mrs Esther Vanhomrigh (the celebrated Vanessa); and thither he took Mr Berkeley. Some years before her death this lady removed to Ireland, and fixed her residence at Cell-bridge, a pleasant village in the neighbourhood of Dublin, most probably with a view of frequently enjoying the company of a man for whom she had conceived a very singular attachment. But finding herself totally disappointed in that expectation, she altered her intention of making the dean of St Patrick's her heir, and left the whole of her fortune (L. 8000), to be divided equally between her near relation judge Marshal of the common-pleas in Ireland, and Dr Berkeley whom she had never seen but once in her life, and that at the distance of nine years.

In the interval between Dr Berkeley's return from abroad and his preferment to the deanery of Derry, his mind had been employed in conceiving a noble and benevolent plan for the better supplying of the churches in our foreign plantations, and for converting the savage Americans to Christianity, by erecting a college in the Summer Islands. To this proposal the address and abilities of its author procured, after a tedious attendance on the great, an apparently successful reception; for he obtained a charter for its foundation, together with a parliamentary grant of L. 20,000 for carrying it into execution, to which were added several large subscriptions from individuals to be paid as soon as the public bounty should be received. Upon the faith of this, our philosopher embarked for America; where he became so generally and so justly venerated by all descriptions of men, that each vied with the other which should most honour him. The queen, with whom he was a favourite, had endeavoured to dissuade him from this enterprise, by offering him her interest for an English bishopric; but he replied, that he should prefer the headship of St Paul's college at Bermuda to the primacy of all England. From that headship he was to enjoy a revenue of L. 100 *per annum*; and was bound by his charter to resign his deanery, then worth L. 1100 *per annum*, within a year and a half after the L. 20,000 should be paid by government. That sum was never paid; and after two years residence on Rhode Island and its neighbouring continent, during which time every interest of piety and virtue was near to his heart and cultivated by his labours, the dean was obliged to return to Europe, and abandon one of the noblest designs that had ever entered into the human heart to form.

In August 1728, immediately before his departure for America, he entered into marriage with Anne, the eldest daughter of the right honourable John Forster, Esq; speaker of the Irish house of commons; which lady died 1785. In May 1734 he was consecrated bishop of Cloyne, and vacated his deanery. On that occasion he said to his few intimates, "I will never accept of a translation." At Cloyne he distinguished himself by pastoral vigilance, prelatical hospitality, and constant residence. Through the whole of his clerical life, he was, while his health permitted, a constant and an extemporaneous preacher; nor is it known that he ever reduced a single sermon to writing, except one preached before the society for propagating the gospel in foreign parts, which at their request was published. He endeared himself to the people of his diocese by promoting at once their temporal and their spiritual happiness. He endeavoured by all means to raise a spirit of industry, and to propagate the arts of cultivation and agriculture in that neglected country; and it may be truly said, that never man laboured more earnestly to amass a fortune or to aggrandize a family, than he did to promote the best interests of mankind, considered either as citizens on earth or as candidates for heaven.

The earl of Chesterfield, who had never seen him but once, and that when they were both young men, on being made lord lieutenant of Ireland sent to him a most respectful offer of the then vacant see of Clogher, of more than double the value of Cloyne, promising at the same time his recommendation to any other richer see that might be vacated during his administration. But the good bishop declined the generous offer, requesting the lord lieutenant not to think of him on any other vacancy,

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cy, as he was resolved never to quit his first bishopric for any other. In 1751, finding the infirmities of age come upon him, and wishing to retire from the care of his diocese to superintend the education of his son (then nominated a student of Christ-church, and now prebendary of Canterbury), that the revenues of the church might not be misapplied, nor the interests of religion suffer by the absence of the pastor from his flock, he made great interest for leave to resign his bishopric, of which the income was then not less than L. 1700 *per annum*. Failing of success in this application, he let the lands of his demesne at Cloyne, on very easy terms, at the rent of L. 200, which he directed to be distributed annually among the poor house-keepers of Cloyne, Youghall, and Aghadda, until his return.

At Oxford he lived highly respected by the learned members of that great university, till the hand of Providence unexpectedly deprived them of the pleasure and advantage derived from his residence among them. On Sunday evening January 14th 1753, as he was sitting in the midst of his family, and just after he had concluded an extemporaneous comment on the 15th Chapter of 1 Cor. he was instantly translated, without a groan, from earth to heaven. A polypus in the heart was the cause of his dissolution. About a minute before his death he had seated himself on a couch and turned his face towards the wall; and had he not ceased speaking *in the middle of a sentence*, his lady and his son would not immediately have discovered their loss. His remains were, with much funeral solemnity, interred at Christ-church, his friend bishop Conybeare then dean of that cathedral performing the last service. An elegant marble monument with a spirited inscription by the present archbishop of York mark the spot where his ashes rest. As to his person, he was of the tall middle size; his countenance was very handsome, and full of meaning and benignity; and his bodily strength was uncommonly great even to the last year of his life; but he was subject to grievous nervous colics, in which he thought tar-water gave him more efficacious aid than any other medicine. Mr Pope sums up his character in one line. After mentioning some particular virtues which characterised other prelates then living, he ascribes

To Berkeley ev'ry virtue under heav'n.

An admirable description is given of him in the following anecdote. Bishop Atterbury, having heard much of Mr Berkeley, wished to see him. Accordingly he was one day introduced to that prelate by the earl of Berkeley. After some time, Mr Berkeley quitted the room: on which Lord Berkeley said to the bishop, 'Does my cousin answer your lordship's expectations?' The Bishop lifting up his hands in astonishment, replied, 'So much understanding, so much knowledge, so much innocence, and such humility, I did not think had been the portion of any but angels, till I saw this gentleman.' His knowledge is said to have even extended to the minutest objects, and included the arts and business of common life. Thus Dr Blackwell, in his *Memoirs of the Court of Augustus*, having made an observation, 'that the ingenious mechanic, the workers in stone and metal, and improvers in trade, agriculture, and navigation, ought to be searched out and conversed with, no less than the professors of speculative science,' adds the following eulogium on our prelate: 'In this respect I would with

pleasure do justice to the memory of a very great though singular sort of a man, Dr Berkeley, better known as a philosopher and intended founder of an university in the Bermudas or Summer Islands, than as bishop of Cloyne in Ireland. An inclination to carry me out on that expedition, as one of the young professors on his new foundation, having brought us often together, I scarce remember to have conversed with him on that art, liberal or mechanic, of which he knew not more than the ordinary practitioners. With the widest views, he descended into a minute detail, and begrudged neither pains nor expence for the means of information. He travelled through a great part of Sicily on foot; clambered over the mountains and crept into the caverns to investigate its natural history, and discover the causes of its volcanoes: and I have known him sit for hours in forgeries and founderies to inspect their successive operations. I enter not into his peculiarities either religious or personal: but admire the extensive genius of the man, and think it a loss to the western world that his noble and exalted plan of an American university was not carried into execution. Many such spirits in our country would quickly make learning wear another face.'

He published many ingenious works, particularly, 'An essay towards a new theory of vision;' 'The principles of human knowledge;' the singular notions in which gave rise to much controversy: 'Alciphron, or the minute philosopher;' one of the most elegant and genteel defences of that religion which he was born to vindicate both by his virtues and his ingenuity: 'The Analyst;' in which he endeavours to show that Sir Isaac Newton's doctrine of fluxions is more incomprehensible than any mystery in the Christian religion: 'The Querist;' in which the true interests of Ireland are pointed out in a very striking light: and 'Siris, or a treatise on tar-water,' which, under his sanction, became for a while a very popular medicine. In the *Gentleman's Magazine* for January 1777, it is said that the adventures of Signior Gaudenzio di Lucca have been generally attributed to Bishop Berkeley; but we have the best authority to say that they were not the offspring of his pen. The bishop never saw the work till it was put into his hands by his son; and when he read it, he expressed no small contempt for the style of a writer who describes his hero as a *tall clean made gentleman*; though he owned his fancy to be often brilliant. We believe the adventures of Gaudenzio di Lucca were written by a Romish priest for his amusement when a prisoner in the Tower of London.

BEKSHIRE, is an inland county of England, which contained the whole of that British principality inhabited by the Atrebatii, who are supposed to have been originally from Gaul. When Constantine divided the island into Roman provinces in 310, this principality was included in Britannia Prima, the first division, whose boundaries were the English channel on the south, and the Thames and Severn on the north. On the Romans quitting the island, and civil dissensions enabling the Saxons to establish the Heptarchy, this part of the country was included in the kingdom of the West-Saxons, which commenced in 519, and continued till 828, when it became the only remaining sovereignty, having conquered all the others, and they were incorporated by the name of England, under Egbert; whose grandson, Alfred, a native of Wan-

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Berkshire. tate in this county, in 889 divided his kingdom into counties, hundreds, and parishes, and at that time this division first received its appellation of Berkshire or Berrocshire. At present it is in the Oxford circuit, the province of Canterbury, and diocese of Salisbury. The general shape of it somewhat resembles the form of a slipper or sandal. It contains an area of 654 square miles, or 527,000 square acres, is 39 miles long, 29 broad, and is about 137 in circumference. It supplies 560 men to the national militia, is situated north-west from London, has 140 parishes, 62 vicarages, 12 market towns, but no city: 671 villages, 135,000 inhabitants, 11,560 houses that pay the tax, is divided into 20 hundreds, sends nine members to parliament, two for the county, two for Windsor, two for Reading, two for Wallingford, and one for Abingdon; and pays 10 parts of the proportion of the land-tax. Its principal river is the Thames. It also has the Kennet, great part of which is navigable; the Lodon, the Ocke, and the Lambourne, a small stream, which, contrary to all other rivers, is always highest in summer, and shrinks gradually as winter approaches. The air of this county is healthy even in the vales; and though the soil is not the most fertile, yet it is remarkably pleasant. It is well stored with timber, particularly oak and beech, and produces great plenty of wheat and barley. Its principal manufactures are woollen cloth, sail cloth, and malt.

Its market towns are Abingdon, Faringdon, Hungerford, East-Ilkley, Lower-Lambourne, Maidenhead, Newbury, Ockingham, Reading, Wallingford, Wantage, and Windsor, remarkable for its royal castle, as the county is for White-horse-hill, near Lambourne, where is the rude figure of a horse, which takes up near an acre of ground on the side of a green hill, said to have been made by Alfred in the reign of his brother Ethelred, as a monument to perpetuate a victory over the Danes in 871, at Ashdown now Ashbury-Park.

The Roman Watling-street, from Dunstable, enters Berkshire at the village of Streatley, between Wallingford and Reading, and crossing this county proceeds to Marlborough. Another Roman road from Hampshire enters this county, leads to Reading and Newbury, the Spinæ of Cambden, where it divides: one branch extends to Marlborough in Wilts, and the other to Cirencester in Gloucestershire. A branch from the Icknield-street proceeds from Wallingford to Wantage.

There is a Roman camp near Wantage on the brow of a hill, of a quadrangular form; there are other remains of encampments at East-Hampstead, near Ockingham, near White-horse-hill, near Pusey, and upon Sinodun-hill, near Wallingford. At Lawrence Waltham is a Roman fort, and near Denchworth is Cherbury castle a fortress of Canute. Uffington castle, near White-horse-hill, is supposed to be Danish; and near it is Dragon-hill, supposed to be the burying place of Uter Pendragon, a British prince. Near White-horse-hill are the remains of a funeral monument of a Danish chief slain at Ashdown by Alfred. In this county the following antiquities are worthy the notice of travellers: Abingdon church and abbey; Aldworth castle, near East Ilkley; Bysham monastery; Dunnington castle; Lambourne church; Reading abbey; Sunning chapel; Wallingford church and castle; Windsor castle

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beggars all description for situation, &c. Berkshire is an earldom belonging to a branch of the Howard family, the representative being earl of Suffolk and Berkshire.

Berlin.

BERLIN, a city of Germany, capital of the electorate of Brandenburg, and of the whole Prussian dominions, seated in E. Long. 13. 37. N. Lat. 52. 53. This city is one of the largest, best built, and best governed, of any in Germany. The streets are large, straight, clean, and well paved, and some of them very long and elegant. There are also several large and beautiful squares, with pleasant walks. It is surrounded with handsome gardens, which produce excellent fruit. The river Spree, that crosses the city, has a communication with the Havel Oder, and Elbe, which greatly facilitate commerce. The French refugees have greatly contributed to the embellishment of the grandeur of Berlin; inasmuch as they have introduced all kinds of manufactures and various arts.

Berlin is divided into five parts, without reckoning the suburbs, which are very large. The houses in these last are almost all of wood; but so well plastered, that they seem to be of stone. In the suburb called *Spandau* is a house belonging to the royal family, with well contrived apartments, and furnished in a very fine taste. In the suburb of *Stralau* is a house and garden belonging to the king. The royal gate of the city is defended by a half moon, and two bastions, covered with brick; it fronts the royal street, which is one of the longest and most frequented in the city. It contains very handsome houses, particularly those belonging to some of the ministers of state.

The royal street is crossed by five others, which are large and fine. On the new bridge, which is of stone, over the Spree, is an equestrian statue of William the Great, which is esteemed an exquisite piece of workmanship. The elector is represented in a Roman habit, and his horse stands on a pedestal of white marble adorned with basso relievos, and four slaves bound to the base.

After this bridge is past, the king's palace appears, which is a grand and superb edifice; it is four stories high, and the apartments are extremely magnificent. No place in Europe has such a great quantity of silver tables, stands, lustres, branched candlesticks, &c. In the knights hall there is a buffet, which takes up all one side, where there are basons and cisterns of gilt silver, of extraordinary magnitude. The furniture of the great apartment is extremely rich; and there is a very handsome gallery, adorned with paintings, representing the principal actions of Frederic I. Formerly there were fine gardens to the palace, but they are now turned into a place of arms. The king's stables are large, stand near the palace, and front the great street. Externally they make a Gothic appearance, but within they are very magnificent. The mangers are of stone, and the pillars that divide the stalls are of iron, adorned with the king's cypher, gilt. Over the racks are pictures representing the finest horses which the king's stud has produced. Over the stables there are large rooms, containing all sorts of horse-furniture, particularly the horse-equipage of Frederic I. all the metallic part of which is gold, set with diamonds. Besides these, there are handsome lodgings for the officers of the stables. Over the riding-house is a theatre, where

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plays have been acted, and balls have been made for the entertainment of the court.

The arsenal consists of four grand buildings, that form a court in the middle, like a college: each front has three large porticos. On the principal gate is a medallion of Frederic II. in bronze; and the four cardinal virtues, of a colossal stature, placed on pedestals on each side of the portico, seem to look at the portrait of the king, which is supported by Fame and Victory. The Corinthian order is prevalent in the first stage, and is managed with a great deal of art. The whole edifice is surrounded in the upper part with a ballustrade, adorned with trophies and statues, among which is Mars seated on a heap of several sorts of arms. This altogether forms a noble and majestic decoration. It is bounded with iron in the shape of cannon, which are placed at proper distances, and support iron chains that hang like festoons, to prevent passengers from approaching the windows below. The lower rooms are filled with a great number of brass cannon; the walls and pillars which sustain the floor are set off with cuirasses and helmets. The upper story contains several rooms filled with arms, which are disposed in a curious order. Behind the arsenal is the house of the general of the artillery, which includes the foundery, where they are continually at work. Besides this there are other places where they keep the train of artillery.

The opera-house is an elegant modern edifice. The front has a noble portico supported by Corinthian columns, and a pediment adorned with basso relievos and statues. The columns that support the roof throw the whole into a grand saloon. It has three galleries, and is said to be capable of containing 2000 persons.

A rampart and fosse separate Worder from Dorothea Stadt, or the New Town, inhabited chiefly by French. There are seven great alleys or walks, which divide this quarter into two parts. The middle walk is broader than the rest, and is surrounded with ballustrades, having a grass-plot in the middle: this is for persons that take the air on foot. The alleys on each side are paved, and serve for those that come abroad in coaches. These alleys, which are about three miles in length, are terminated with a bar, that leads towards the park. The alleys with trees are bounded by rows of houses. In one of these is a building, formerly called the *lesser stables*, and now made into lodgings for the guards. The apartments above these are occupied by the academy of painting and the academy of arts and sciences. Behind these is the observatory, where there is a great number of astronomical and mathematical instruments.

There are other things worthy of observation, such as the cabinet of medals, and of the antiquities belonging to the king; that of natural curiosities; the chemical laboratory, and its furnaces and medals, of a new invention: the theatre for anatomical demonstrations; the royal library, which is one of the completest in Germany, and has many scarce books and manuscripts.

The city was taken in 1760 by an army of Russians, Austrians, Saxons, &c. who entered on the 9th of October. They totally destroyed the magazines, arsenals, and founderies, seized an immense quantity of military stores, and a number of cannon and arms; called first for the immediate payment of 800,000 guilders, and then laid on a contribution of 1,900,000

German crowns: not satisfied with this, many irregularities were committed by the soldiery; but on the whole, though some shocking actions were committed, a far more exact discipline was observed than from such troops could have been expected upon such an occasion, where there was every incentive which could work upon the licence of a conquering army. Their officers no doubt with great difficulty preserved even that degree of order.

But though their behaviour was tolerable with regard to the private inhabitants, there was something shocking and ungenerous in their treatment of the king's palaces. The apartments of the royal castle of Charlottenburgh were entirely plundered, the precious furniture spoiled, the pictures defaced, without even sparing the antique statues collected by cardinal Polignac, which had been purchased by the house of Brandenburg. The castle of Schonhausen, belonging to the queen, and that of Fredericsfeld, belonging to the Margrave Charles, were also plundered.

The palace of Potsdam, the famous Sans Souci, had a better fate; Prince Esterhasi commanded there, and it was preserved from the smallest violation. The prince, on viewing the palace, only asked which picture of the king resembled him most; and being informed, desired that he might have leave to take it, together with two German flutes which the king used, to keep them, he said, in memory of his majesty. This was a sort of taking very different from pillage.

They staid in the city four days: but hearing that the king, apprehensive of this stroke, was moving to the relief of his capital, they quitted it on the 13th of October; and having wasted the whole country round for a vast extent, and driven away all the cattle and horses they could find, retreated by different routes out of Brandenburg.

BERLIN, a sort of vehicle, of the chariot kind; taking its name from the city of Berlin, in Germany: though some attribute the invention of it to the Italians, and derive the word from *berlina*, a name given by them to a sort of stage, whereon persons are exposed to public shame. The berlin is a very convenient machine to travel in, being lighter, and less apt to be overturned, than a chariot. The body of it is hung high, on shafts, by leathern braces; there being a kind of stirrup, or footstool, for the conveniency of getting into it: instead of side-windows, some have screens to let down in bad, and draw up in good, weather.

BERME, in fortification, a space of ground left at the foot of the rampart, on the side next the country, designed to receive the ruins of the rampart, and prevent their filling up the fosse. It is sometimes palisadoed, for the more security; and in Holland it is generally planted with a quick-set hedge. It is also called *liziere*, *relais*, *foreland*, *retrait*, *pais de souris*, &c.

BERMUDAS, or SUMMER-ISLANDS, a cluster of small islands in the Atlantic ocean, lying almost in the form of a shepherd's crook, in W. Long. 65. N. Lat. 32. 30. between 200 and 300 leagues distant from the nearest place of the continent of America, or any of the other West-India islands. The whole number of the Bermudas islands is said to be about 400, but very few of them are habitable. The principal is St George's, which is not above 16 miles long, and three at most in breadth. It is universally agreed, that the nature of this

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this and the other Bermudas islands has undergone a surprising alteration for the worse since they were first discovered; the air being much more inclement, and the soil much more barren, than formerly. This is ascribed to the cutting down those fine spreading cedar-trees for which the islands were famous, and which sheltered them from the blasts of the north-wind, at the same time that it protected the undergrowth of the delicate plants and herbs. In short, the Summer-islands are now far from being desirable spots; and their natural productions are but just sufficient for the support of the inhabitants, who chiefly for that reason perhaps, are temperate and lively even to a proverb. At first tobacco was raised upon these islands; but being of a worse quality than that growing on the continent, the trade is now almost at an end. Large quantities of ambergris were also originally found upon the coasts, and afforded a valuable commerce; but that trade is also reduced, as likewise their whale trade, though the perquisites upon the latter form part of the governor's revenue, he having L. 10 for every whale that is caught. The Bermudas islands, however, might still produce some valuable commodities, were they properly cultivated. There is here found, about three or four feet below the surface, a white chalk stone which is easily chiseled, and is exported for building gentlemens houses in the West-Indies. Their palmetto leaves, if properly manufactured, might turn to excellent account in making womens hats; and their oranges are still valuable. Their soil is also said to be excellent for the cultivation of vines, and it has been thought that silk and cochineal might be produced; but none of these things have yet been attempted. The chief resource of the inhabitants for subsistence is in the remains of their cedar-wood, of which they fabricate small sloops, with the assistance of the New-England pine, and sell many of them to the American colonies, where they are much admired. Their turtle-catching trade is also of service: and they are still able to rear great variety of tame-fowl, and have wild ones abounding in vast plenty. All the attempts to establish a regular whale-fishery on these islands have hitherto proved unsuccessful; they have no cattle, and even the black hog breed, which was probably left by the Spaniards, is greatly decreased. The water on the islands, except that which falls from the clouds, is brackish; and at present the same diseases reign there as in the Caribbee islands. They have seldom any snow, or even much rain; but when it does fall, it is generally with great violence, and the north or north-east wind renders the air very cold. The storms generally come with the new moon; and if there is a halo or circle about it, it is a sure sign of a tempest, which is generally attended with dreadful thunder and lightning. The inhabited parts of the Bermuda islands are divided into nine districts called *tribes*. 1. St George. 2. Hamilton. 3. Ireland. 4. Devonshire. 5. Pembroke. 6. Pagets. 7. Warwick. 8. Southampton. 9. Sandys. There are but two places on the large island where a ship can safely come near the shore, and these are so well covered with high rocks that few will choose to enter in without a pilot; and they are so well defended by forts, that they have no occasion to dread an enemy. St George's town is at the bottom of the principal haven; and is defended by nine forts, on which are mounted 70 pieces of cannon that command the entrance. The town has a handsome church, a fine

library, and a noble town-house, where the governor, council, &c. assemble. Besides these there are about 1000 houses well built. The tribes of Southampton and Devonshire have each a parish-church and library, and the former has a harbour of the same name; there are also scattered houses and hamlets over many of the islands, where particular plantations require them. The inhabitants are clothed chiefly with British manufactures, and all their implements for tilling the ground and building are made in Britain.

It is uncertain who were the first discoverers of the Bermudas islands. John Bermudas a Spaniard is commonly said to have discovered them in 1527; but this is disputed, and the discovery attributed to Henry May an Englishman. As the islands were without the reach of the Indian navigation, the Bermudas were absolutely uninhabited when first discovered by the Europeans. May abovementioned was shipwrecked upon St George's; and with the cedar which they felled there, assisted by the wreck of their own ship, he and his companions built another which carried them to Europe, where they published their accounts of the islands. When Lord Delawar was governor of Virginia, Sir Thomas Gates, Sir George Summers, and Captain Newport, were appointed to be his deputy-governors; but their ship being separated by a storm from the rest of the squadron, was in the year 1609 wrecked on the Bermudas, and the governors disagreeing among themselves, built each of them a new ship of the cedar they found there, in which they severally sailed to Virginia. On their arrival there, the colony was in such distress, that the Lord Delawar, upon the report which his deputy-governors made him of the plenty they found at the Bermudas, dispatched Sir George Summers to bring provisions from thence to Virginia in the same ship which brought him from Bermudas, and which had not an ounce of iron about it except one bolt in the keel. Sir George, after a tedious voyage, at last reached the place of his destination, where, soon after his arrival, he died, leaving his name to the islands, and his orders to the crew to return with black hogs to the colony of Virginia. This part of his will, however, the sailors did not choose to execute; but setting sail in their cedar ship for England, landed safely at Whitchurch in Dorsetshire.

Notwithstanding this dereliction of the island, however, it was not without English inhabitants. Two sailors, Carter and Waters, being apprehensive of punishment for their crimes, had secreted themselves from their fellows when Sir George was wrecked upon the island, and had ever since lived upon the natural productions of the soil. Upon the second arrival of Sir George, they enticed one Chard to remain with them; but differing about the sovereignty of the island, Chard and Waters were on the point of cutting one anothers throats, when they were prevented by the prudence of Carter. Soon after, they had the good fortune to find a great piece of ambergris weighing about 80 pounds, besides other pieces, which in those days were sufficient, if properly disposed of, to have made each of them master of a large estate. Where they were, this ambergris was useless; and therefore they came to the desperate resolution of carrying themselves and it in an open boat to Virginia or to Newfoundland, where they hoped to dispose of their treasure to advantage. In the mean time, however, the

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Bermudas.

Virginia Company claimed the property of the Bermudas islands; and accordingly sold it to 120 persons of their own society, who obtained a charter from King James for their possessing it. This New Bermudas Company, as it was called, fitted out a ship with 60 planters on board to settle on the Bermudas, under the command of one Mr Richard Moor, by profession a carpenter. The new colony arrived upon the island just at the time the three sailors were about to depart with their ambergris; which Moor having discovered, he immediately seized and disposed of it for the benefit of the company. So valuable a booty gave vast spirit to the new company; and the adventurers settled themselves upon St George's island, where they raised cabins. As to Mr Moor, he was indefatigable in his duty, and carried on the fortifying and planting the island with incredible diligence; for we are told, that he not only built eight or nine forts, or rather blockhouses, but inured the settlers to martial discipline. Before the first year of his government was expired, Mr Moor received a supply of provisions and planters from England; and he planned out the town of St George as it now stands. The fame of this settlement soon awakened the jealousy of the Spaniards, who appeared off St George's with some vessels; but being fired upon by the forts, they sheered off, though the English at that time were so ill provided for a defence, that they had scarce a single barrel of gunpowder on the island. During Moor's government the Bermudas were plagued with rats which had been imported into them by the English ships. This vermin multiplied so fast in St George's island, that they even covered the ground, and had nests in the trees. They destroyed all the fruits and corn within doors; nay, they increased to such a degree, that St George's island was at last unable to maintain them, and they swam over to the neighbouring islands, where they made as great havock. This calamity lasted five years, though probably not in the same degree, and at last it ceased all of a sudden.

On the expiration of Moor's government, he was succeeded by Captain Daniel Tucker, who improved all his predecessor's schemes for the benefit of the island, and particularly encouraged the culture of tobacco. Being a severe disciplinarian, he held all under him so rigidly to duty, that five of his subjects planned as bold an enterprize for liberty as was perhaps ever put in execution. Their names were Barker, who is said to have been a gentleman; another Barker, a joiner; Goodwin, a ship-carpenter; Paet, a sailor; and Saunders, who planned the enterprize. Their management was as artful as their design was bold. Understanding that the governor was deterred from taking the pleasure of fishing in an open boat, on account of the dangers attending it, they proposed to build him one of a particular construction, which accordingly they did in a secret part of the island; but when the governor came to view his boat, he understood that the builders had put to sea in it. The intelligence was true: for the adventurers, having provided themselves with the few necessities they wanted, sailed for England; and notwithstanding the storms they encountered, their being plundered by a French privateer, and the incredible miseries they underwent, they landed in 42 days time at Corke in Ireland, where they were generously relieved and entertained by the Earl of Thomond.

In 1619 Captain Tucker resigned his government

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to Captain Butler. By this time the high character which the Summer-islands bore in England rendered it fashionable for men of the highest rank to encourage their settlement; and several of the first nobility of England had purchased plantations among them. Captain Butler brought over with him 500 passengers, who became planters on the islands, and raised a monument to the memory of Sir George Summers. The island was now so populous (for it contained about a thousand whites), that Captain Butler applied himself to give it a new constitution of government by introducing an assembly, the government till this time being administered only in the name of the governor and council. A body of laws was likewise drawn up, as agreeable to the laws of England as the situation of the island would admit of. One Mr Barnard succeeded Captain Butler as governor, but died six weeks after his arrival on the island; upon which the council made choice of Mr Harrison to be governor till a new one should be appointed. No fewer than 3000 English were now settled in the Bermudas, and several persons of distinction had curiosity enough to visit it from England. Among these was Mr Waller the poet, a man of fortune, who being embroiled with the parliament and commonwealth of England, spent some months in the Summer-islands, which he has celebrated in one of his poems as the most delightful place in the world. The dangers attending the navigation, and the untowardly situation of these islands, through their distance from the American continent, seem to be the reasons why the Bermudas did not now become the best peopled islands belonging to England; as we are told that some time ago they were inhabited by no fewer than 10,000 whites. The inhabitants, however, never showed any great spirit for commerce, and thus they never could become rich. This, together with the gradual alteration of the soil and climate already taken notice of, soon caused them dwindle in their population; and it is computed that they do not now contain above half the number of inhabitants they once did, and even these seem much more inclined to remove to some other place than to stay where they are; so that unless some beneficial branch of commerce be found out, or some useful manufacture established, the state of the Bermudas must daily grow worse and worse.

BERN, one of the cantons of Switzerland, which holds the second rank among the 13; but as it is by far the largest in extent, containing almost one-third of the whole country, it seems justly intitled to the first. It is bounded to the north by the cantons of Basil and Solothurn, and the Austrian forest-towns; to the south by the lake of Geneva, the Valais, and duchy of Savoy; to the east by Uri, Underwald, Lucern, and the county of Baden; and to the west by Solothurn, Neuchatel, Franche-Compte, the district of Biel, and the land of Gex. It is the most fruitful, the richest, and by much the largest, of all the cantons, extending in length about sixty leagues, and about thirty where broadest. It yields not only plenty of grain, fruit, and pasture; but also good wine, a variety of coloured earths and clays, sand-stone, mundick, gypsum, pit-coal, sulphur, and iron-ore. Here likewise are large herds of cattle, great and small; and, in consequence of that, great quantities of milk, butter, and cheese. The rivers that water this canton are the Aar, the Emmat, the Wigger, the Aaa, the Ruz, the Limmat,

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the Sanen, the Senfen, and the Kandel. The principal lake is that of Geneva; the length of which is about 18 leagues, and the greatest breadth between three and four. The depth in some places is near 400 fathoms, in others not above 40. The Rhone enters it at the east end near Bouveret, and issues out again at the west close by Geneva. In summer its waters are much swelled by the melting of the snow on the mountains. This lake, however, is not entirely surrounded by the territory of Bern, but partly by Savoy and the country of Gex; the former of which belongs to the king of Sardinia, and the latter to France, and the territory of Sion. Its borders are extremely fertile and beautiful, being much embellished with vineyards, which yield excellent wine, and interspersed with towns and villages, betwixt which a considerable commerce is carried on. The other great lakes, that are wholly or partly within this canton, are those of Neufchatel, Biel, Murte, Thun, Brien, and Halwyl, which all abound in fish, particularly that of Geneva, where trouts are sometimes caught weighing 40 or 50 pounds. In that of Biel, called also the *Nydau-lake*, are two small islands, one of which is very beautiful. This lake is about three leagues in length, and one in breadth. Along the whole west and north-west sides of the canton runs that chain of mountains called by the general name of *Jura*; but the several mountains of which it is composed have all their particular names. This canton is well cultivated, and very populous, the number of its subjects being computed at 400,000. German is the prevailing language, but almost all the people of fashion speak either French or Italian; even the common people in the Pais de Vaud, and other places that lie towards France or Italy, speak a corrupt French or Italian, or a jargon composed of both. The established religion here and the other Protestant cantons is Calvinism, the same both in doctrine and discipline as in Holland; nor is any other tolerated, except in the common bailiages, and the vale of Frick. The ministers are divided into deaneries and classes, and hold yearly chapters or synods. They are kept in a greater dependence on the civil power here than in the other cantons, and not suffered to interfere with matters of state. The city of Bern first joined the confederacy in the year 1353. Towards the defence thereof the canton now furnishes 2000 men. Every male from 16 to 60 is inrolled in the militia, and about a third of them regimented. There are officers for every district, whose province it is to see that the men be regularly exercised; that their arms, ammunition, and clothing, be in good condition; and that they be kept in a constant readiness to march. Once a-year they are drawn out to a general review. The same attention is paid to those that belong to the train of artillery. Some regiments consist of married, and some of unmarried men; some of foot, others of dragoons. There is also one regiment and a troop of cuirassiers. The latter consists entirely of burghers of Bern. Both the horsemen and footmen find their horses, arms, and accoutrements. Besides the arms and artillery in the arsenal at Bern, all the castles, where the country governors or bailiffs reside, are well furnished with them. At Bern is a constant guard or garrison of 200 men, and a small garrison at Fort Arburg. In the same city is also an office, which grants licences for levies to foreign powers, and where the recruits make their appearance and are re-

gistered. The bailiffs have the chief direction of affairs in their several districts, being generals of the militia, and presiding in the courts of justice; but, in civil causes above a certain value, an appeal lies from them to Bern; and, in capital cases, their sentence must be confirmed by the great council before it can be executed. When any bailiwick is to be disposed of, as many balls as there are competitors are put into a bag, whereof one is gilt, and he that draws that has the bailiwick.

Mr Keyssler observes, that the wealthiest peasants in Switzerland are those of Bern; it being difficult to find a village without one, at least, who is worth between 20,000 or 30,000 guilders, and sometimes even 60,000. He says, the common people of both sexes wear straw hats, and that the womens petticoats are tied up so near their arm-pits, that hardly an hand's-breadth is left for their shape; that the inns, not only in this canton but throughout Switzerland, are in general very good; but the manners of the people were, in many respects, greatly changed within 50 years before he visited them, which was about 50 years ago, and consequently must be much more so now; that, instead of the plainness and honest simplicity of their ancestors, the love of superfluities and high living greatly prevailed; that luxury, pomp, and that infatuation for foreign productions which had infected most parts of Europe, had also extended its contagious influence to Switzerland, though not to such a degree as in many other countries. Dr Burnet says, that drinking is so common, and produces so many quarrels and disorders, that the bailiffs not only subsist by the fines payable for them, but often get estates, carrying perhaps 20,000 crowns at the end of five years to Bern; that their law is short and clear, insomuch that the most intricate suit is ended after two or perhaps three hearings, either in the first instance before the bailiff, or in the second at Bern; that the civility expressed in this country to women, at first meeting them, is not by saluting them, but by shaking them by the hand, and that none but strangers take off their hats to them. Mr Addison says, that the peasants are generally clothed in a coarse kind of canvas, the manufacture of the country, and that their holiday-clothes go from father to son; so that it is not uncommon to see a countryman in his great-grandfather's doublet and breeches; that the belief of witchcraft prevailed among them so much, that there were some executions on that account while he was in the country; that the question, or torture, is used not only in this canton but all over Switzerland; that though the subjects of the state are rich, the public is poor; and though they could oppose a sudden invasion, yet that their unkindly soil requires such a number of hands to cultivate it, that they could not spare the reinforcements and recruits that would be necessary in a long war. Upon extraordinary occasions, however, they boast that they could raise 80,000 men in 24 hours. This canton is divided into the Germany country, that is, that part of the canton in which the German tongue is spoken, and which is also called the *ancient canton*, extending from Morat to the county of Baden; and the Roman, called also the *Waul*, and *Pais de Vaud*. The former of these contains 35 bailiwicks and about 300 parishes.

BERN, a city of Switzerland, and capital of the canton of that name, is situated in E. Long. 7. 40. N.

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Lat. 46. 0. It is said that the taking of a bear on the day on which the foundation of this city was laid, gave occasion to its name; hence it is often in Latin called *Arctopolis*, i. e. the city of the bear, and has a bear for its coat of arms. It is almost surrounded by the river Aar. The houses are mostly built of white free-stone, and, in the principal streets, have piazzas or arches under them, for the conveniency of walking dry in wet weather. Most of the streets are paved with flints, and traversed by a canal lined with free-stone, which is brought from a considerable distance, and is very useful in carrying off the filth of the city, extinguishing fires, and other purposes. The city is large, standing almost in the middle of the canton, and containing several churches, of which one is called the *Great Church*, and the first minister thereof the *dean*, who is the head of the city-clergy. From an inscription near the great door of this church, it appears, that the first stone of it was laid in 1421. Over the same door is a representation of the last judgment, in which the sculptor hath placed the pope among the damned. In this city is also a college with eight professors, a large public library, and a museum; a stately granary, in which a great quantity of corn is always kept; a guildhall; a well stored arsenal; and several hospitals. In the arsenal is a wooden statue of the famous Tell, which represents him as taking aim at the apple placed on the head of his son. There is also the statue of Berch told von Zahringen, the founder of the city; and two large horns of buffaloes or wild bulls, called in Latin *Uri*, such as are used in war by the canton of Uri, instead of trumpets, and taken from it in the year 1712. Hard by also hang the grotesque dresses of those who blew them. The inhabitants of Uri, who boast their descent from the old Tau, bear a buffalo's head on their risai, coat of arms; and the person who blows the great horn in time of war, is called the *bull of Uri*. In the Dominican church, a hole in the wall is always shown to strangers, by means of which, it having a communication with the cell of a monk in an adjoining monastery, the pious fraud of making an image of the Virgin appear to speak was once carried on, which for a while answered the purposes of the monks very well; but they were at last detected and punished. This city, though larger, is not so populous nor so well built as that of Zurich. On the east side of it is a handsome stone bridge: and near the great church is a very fine platform some hundred feet in height, which makes a most delightful walk, being planted with limes, and commanding a charming prospect, particularly of the mountains of the Grisons, covered with snow in the midst of summer. In 1654 a student of divinity, being on horseback, and in liquor, leaped over this terrace without receiving any other hurt than breaking a leg, and lived many years after, but the horse was killed. In the upper part of the city are always kept a number of bears in two inclosures, with fir-trees for them to clamber and play upon. Of the burghers of Bern, only those are qualified for the government and magistracy of the city who are the descendants of such as were made burghers before the year 1635. Other qualifications are also necessary; in particular, they must not be under 30 years of age, and must be enrolled in one of the 12 companies. To obtain a country government, or to hold any considerable employment, the candidate also must be married.

The great council, in which the sovereignty of the canton is vested, consists, when full, of 229; but is generally much short of that number, 80 or more often dying before their places are filled up. The lesser council senate, or, as it is called, the *daily council*, because it meets every day, Sundays and holidays excepted, consists of 27 members, including the two prætors or advoyers, the four tribunes of the people, the two treasurers, and the two heimlichers or secrecy-men, so called because to them all secrets relating to the state are discovered. The members of the great and little councils mutually fill up the vacancies that happen in these two colleges. How the bailiffs are chosen we have already taken notice. Our limits will not permit us to enter into any farther detail with respect to the government: only it is to be observed in general, that all the officers of any note are chosen out of the great or little councils; and that all the bailiffs and castellans of the canton continue six years in office. The trade of the city is not very great, but was less before the French refugees settled therein: some, however, doubt whether it has been a gainer by them; as by their introduction of French modes and luxury, they have helped to banish the ancient Helvetic simplicity and frugality. The territory immediately under its jurisdiction is divided into four governments, with which the four vidders, or standard-bearers, are invested. It declared for the reformation in 1528, after a solemn disputation. Here the British envoy to the cantons resides.

BERN-Machine, the name of an engine for rooting up trees, invented by Peter Sommer, a native of Bern in Switzerland.

This machine is represented by a figure on Plate XCV. drawn from a model in the machine-room of the Society for the Encouragement of Arts, &c. It consists of three principal parts; the beam, the ram, and the lever. The beam ABC, (n^o 1.) of which only one side is seen in the figure, is composed of two stout planks of oak three inches thick at least, and separated by two transverse pieces of the same wood at A and C, about three inches thick. These planks are bored through with corresponding holes, as represented in the figure, to receive iron pins, upon which the lever acts between the two sides of the beam, and which is shifted higher and higher as the tree is raised or rather pushed out of its place. The sides are well secured at the top and bottom by strong iron hoops. The iron pins on which the lever rests should be an inch and a quarter, and the holes through which they pass an inch and a half in diameter. The position of these holes is sufficiently indicated by the figure. The foot of the beam, when the machine is in action, is secured by stakes represented at G, driven into the earth. The ram D, which is made of oak, elm, or some other strong wood, is capped with three strong iron spikes, represented at f, which take fast hold of the tree. This ram is six or eight inches square; and a slit is cut lengthwise through the middle of it, from its lower end at K to the first ferule a, in order to allow room for the chain g h to play round the pulley K, which should be four inches thick, and nine inches in diameter. This ram is raised by means of the chain g h, which should be about ten feet long, with links four inches and three quarters in length, and an inch thick. One end of this chain is fastened to the top

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top of the beam at C, while the other, after passing through the lower part of the ram, and over the pulley K, terminates in a ring or link represented n° 3. the two ears *m n* of which serve to keep it in a true position between the two planks of the beam. In this ring the hook P is inserted. The hook is represented in profile n° 2. where F is the part that takes hold of the ring. But it must be observed, that the parts of this machine, represented in n° 2, 3. are drawn on a scale twice as large as the whole engine. The hook F, n° 2. should be made of very tough iron, as well as the handle D, and the arch E *c*. This handle should be two inches thick at *z*, where it joins to the hook, and the thickness gradually lessen by degrees up to the arch, which need not be more than half an inch thick. On each side of the pin *z*, is a semicircular notch, *x, y*, which rests alternately on the pins when the machine is worked. The hole D, and the arch E *c*, serve to fix a long lever of wood E F, n° 1. by means of two iron pins; and by this contrivance the lever is either raised or depressed at pleasure, in order to render the working of the machine easy in whatever part of the beam the lever may be placed: for without this contrivance the extremity of the lever E F, would, when the handle is near the top of the beam, be much higher than men standing upon the ground could reach. It must however be remembered, that the lever is often shortened by this contrivance, and consequently its power lessened.

The machine is worked in the following manner: It is placed against a tree, in the manner represented in the figure, so that the iron spikes at *f* may have hold of the tree, and the end of the beam A be supported by stakes represented at G. The iron handle n° 2. is placed in the opening between the two planks of the beam, and the wooden lever fixed to it by means of the iron pins already mentioned. The hook F takes hold of the chain, and one of the iron pins is thrust into the outer row of holes, by which means the outer notch *x* will rest on the pin, which will be now the centre of motion; and the end of the lever E, n° 1. being pressed downwards, the other notch *y*, n° 2. will be raised, and at the same time the chain, and consequently the ram. The other iron pin is now to be thrust into the hole in the inner row, next above that which was before the centre of motion, and the end of the lever E elevated or pushed upwards, the latter pin on which the notch *y* rests now becoming the centre of motion. By this alternate motion of the lever, and shifting the pins, the chain is drawn upwards over the pulley K, and consequently the whole force of the engine exerted against the tree. There is a small wheel at L, in order to lessen the friction of that part of the machine.

From this account the reader will very easily perceive that the machine is nothing more than a single pulley compounded with a lever of the first and second order. It must however be remembered, that as the push of the engine is given in an oblique direction, it will exert a greater or lesser force against the horizontal roots of the tree in proportion to the angle formed by the machine with the plane of the horizon; and that the angle of 45° is the maximum, or that when the machine will exert its greatest force against the horizontal roots of the tree.

BERNACLE, in ornithology, a species of goose. See ANAS.

BERNARD (St), the first abbot of Clairvaux, was born in the year 1091, in the village of Fontaine, in Burgundy. He acquired so great a reputation by his zeal and abilities, that all the affairs of the church appeared to rest upon his shoulders, and kings and princes seemed to have chosen him for a general arbitrator of their differences. It was owing to him that Innocent II. was acknowledged sovereign pontiff, and after the death of Peter Leonis anti-pope, that Victory, who had been named *successor*, made a voluntary abdication of his dignity. He convicted Abelard at the council of Sens, in the year 1140. He opposed the monk Raoul; he persecuted the followers of Arnaud de Bresse; and, in 1148, he got Gilbert de la Porvicé, bishop of Poitiers, and Eonde l'Etoile, to be condemned in the council of Rheims. By such zealous behaviour he verified (says Mr Bayle) the interpretation of his mother's dream. She dreamed, when she was with child of him, that she should bring forth a white dog, whose barking should be very loud. Being astonished at this dream, she consulted a monk, who said to her, "Be of good courage; you shall have a son who shall guard the house of God, and bark loudly against the enemies of the faith." But St Bernard went even beyond the prediction, for he barked sometimes against chimerical enemies: he was more happy in exterminating the heterodox, than in ruining the infidels; and yet he attacked these last, not only with the ordinary arms of his eloquence, but also with the extraordinary arms of prophecy. He preached up the crusade under Louis the Younger, and by this means he enlarged the troops of the crusaders beyond expression: but all the fine hopes with which he flattered the people were disappointed by the event; and when complaint was made that he had brought an infinite number of Christians to slaughter without going out of his own country, he cleared himself by saying that the sins of the Croises had hindered the effect of his prophecies. In short, he is said he have founded 160 monasteries, and to have wrought a great number of miracles. He died on the 20th of August 1153, at 63 years of age. The best edition of his works is that of 1690, by father Mabillon.

BERNARD (Dr Edward), a learned astronomer, linguist, and critic, was born at Perry St Paul, on the 2d of May 1638, and educated at Merchant-Taylor's school, and St John's college, Oxford. During his stay at school, he had laid in an uncommon fund of classical learning; so that, on his going to the university, he was a great master of all the elegancies of the Greek and Latin tongues, and not unacquainted with the Hebrew. On his settling in the university, he applied himself with great diligence to history, philology, and philosophy; and made himself master of the Hebrew, Syriac, Arabic, and Coptic languages, and then applied himself to the study of the mathematics under the famous Dr Wallis. Having successively taken the degrees of bachelor and master of arts, and afterwards that of bachelor of divinity in 1668, he went to Leyden to consult several oriental manuscripts left to that university by Joseph Scaliger and Levinus Warnerus. At his return to Oxford, he collated and examined the most valuable manuscripts in the Bodleian library; which

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Bernard. which induced those who published any ancient authors to apply to him for his observations or emendations from the manuscripts at Oxford; which he readily imparted, grudging neither time nor pains to serve the learned; and by this means he became engaged in a very extensive correspondence with the learned of most countries. In the year 1669, the famous Christopher Wren, Savilian professor of astronomy at Oxford, having been appointed surveyor-general of his majesty's works, and being much detained at London by this employment, he obtained leave to name a deputy at Oxford, and pitched upon Mr Bernard, which engaged the latter in a more particular application to the study of astronomy. In 1676, he was sent by the earl of Arlington to France, in order to be tutor to the dukes of Grafton and Northumberland, sons to King Charles II. by the dutchess of Cleveland, who then lived with their mother at Paris: but the simplicity of his manners not suiting the gaiety of the dutchess's family, he returned about a year after to Oxford, and pursued his studies; in which he made great proficiency, as his many learned astronomical and critical works show. He composed tables of the longitudes, latitudes, right ascensions, &c. of the fixed stars; Observations in Latin on the Obliquity of the Ecliptic; and other pieces inserted in the Philosophical Transactions. He also wrote, 1. A Treatise of the ancient Weights and Measures. 2. *Chronologie Samaritane Synopsis*, in two tables. 3. Testimonies of the Ancients concerning the Greek Version of the Old Testament by the Seventy; and several other learned works. He was a person of great piety, virtue, and humanity; and died on the 12th of January 1696, in the 59th year of his age, leaving behind him a great number of learned and valuable manuscripts.

BERNARD (James), professor of philosophy and mathematics and minister of the Walloon church at Leyden, was born September 1st 1658, at Nions in Dauphine. Having studied at Geneva, he returned to France in 1679, and was chosen minister of Venterol, a village in Daphine. Some time after, he was removed to the church of Vinsobres in the same province. But the persecutions raised against the Protestants in France having obliged him to leave his native country, he retired to Holland, where he was received with great civility, and was appointed one of the pensionary ministers of Ganda. In July 1688, he began a political publication intitled *Histoire abrégée de l'Europe*, &c. which he continued monthly till December 1688, and makes five volumes in 12mo. In 1692, he began his *Lettres Historiques* containing an account of the most important transactions in Europe, with necessary reflections. He carried on this work, which was also published monthly, till the end of the year 1698. It was afterwards continued by other hands, and consists of a great many volumes. Mr Le Clerc having left off his *Bibliothèque Universelle*, in 1691, Mr Bernard wrote the greatest part of the 20th volume, and by himself carried on the five following to the year 1693. In 1698, he collected and published *Actes et négociations de la paix de Ryswic*, in four volumes 12mo. In 1699 he began the *Nouvelles de la république des lettres*, which continued till December 1710. Mr Bernard having acquired great reputation by his works, as well as by his sermons at Ganda, and

the Hague, the congregation of the Walloon church at Leyden became extremely desirous to have him for one of their ministers; and a vacancy happening in 1705, he was unanimously chosen. About the same time, Mr de Volder professor of philosophy and mathematics at Leyden having resigned, Mr Bernard was appointed his successor; and the university presented him with the degrees of doctor of philosophy and master of arts. His public and private lectures took up a great part of his time; yet he did not neglect his pastoral function, but composed his sermons with great care: he wrote also two excellent treatises, one on a late repentance, the other on the excellency of religion. In 1716, he published a supplement to Moreri's dictionary in two volumes folio. The same year he resumed his *Nouvelles de la république des lettres*; which he continued till his death, which happened the 27th of April 1718, in the 60th year of his age.

BERNARD the Great (St); a mountain in Savoy and Switzerland, between Valais and the valley of Aouft, at the source of the rivers Drance and Doria. The top is always covered with snow: and there is a great monastery seated thereon, where the monks always entertain travellers without distinction of religion for three days.

BERNARDINE (St), was born at Massa in Tuscany, in 1380. In 1404 he entered into a Franciscan monastery near Sienna, where he became an eminent preacher; and was afterwards sent to Jerusalem, as commissary of the Holy Land. On his return to Italy, he visited several cities, where he preached with such applause, that the cities of Ferrara, Sienna, and Urbino, desired Pope Eugenius IV. to appoint him their bishop: but Bernardine refused the honour, accepting only the office of vicar-general of the friars of the observance for all Italy. He repaired and founded above 300 monasteries in that country; died in 1444; was canonized in 1450 by Pope Eugenius; and his works were published at Venice in 1591, in 4 vols 4to.

BERNARDINES, an order of monks, founded by Robert abbot of Moleme, and reformed by St Bernard. They wear a white robe with a black scapulary; and when they officiate they are clothed with a large gown, which is all white, and hath great sleeves, with a hood of the same colour. The Bernardines differ very little from the Cistercians. They had their origin toward the beginning of the 12th century.

BERNAY, a town of Upper Normandy in France, seated on the river Carantone, in E. Long. 0. 50. N. Lat. 49. 6.

BERNBURG, a town of Germany, in the circle of Upper Saxony, and principality of Anhalt, where a branch of the house of Anhalt resides. It is seated on the river Sara, in E. Long. 12. 30. N. Lat. 51. 55.

BERNERA, one of the western isles of Scotland, lying about two leagues to the southward of Harries. It is about five miles in circumference; the soil is sandy, but when manured with the alga marina, extremely fertile, producing an increase of thirty-fold of barley; nay one grain has been known to produce 14 ears when the season was remarkably favourable. The face of the island is extremely agreeable in summer, exhibiting a pleasing variety of corn fields and clover pasture. Here is a fresh water lake called *Lochbruis*, diversified with small islands, and abounding with eels, which the natives

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tives by the help of lights, catch in the night-time, as they fall down a rivulet towards the sea in heaps twisted together. There are two chapels in this island dedicated to St Asaph and St Columbes; and near the former is a stone standing about eight feet above the ground. At the east end of this island there is a strange reciprocation of the flux and reflux of the sea, and another no less remarkable upon the west side of the long island. The tides from the south-west run along northward; so that during the ordinary course of the tides the flood runs east in the frith, where Bernera lies, and the ebb runs west: thus the sea ebbs and flows regularly for four days before, and as long after, the full and change of the moon; the spring tides generally rising 14 feet perpendicular, and the others proportionably: but for four days before, and as many after, the quarter moons, there is a singular variation; at that time a southerly moon making high water, the course of the tide being eastward, it begins to flow at half an hour after nine in the morning, and continues to flow till half an hour after three in the afternoon, when it is high water; but when it begins to ebb, the current still runs eastward, until it is low water; so that the tide runs eastward 12 hours together, that is, from half past nine in the morning till half past nine at night; yet when the night-tide begins to flow, the current turns and runs westward all night for 12 hours, during both flow and ebb: thus the reciprocations continue, one flood and ebb running eastward and another westward, till within four days of the full and change of the moon; then they resume their ordinary course, running east during the six hours of flood, and west during the six hours of ebb. There is another phenomenon in these tides no less remarkable than that just now mentioned. Between the vernal and autumnal equinox, that is, during one half of the year, the tides about the quarter moons run all day eastward and all night westward; and during the other six months their course is reversed, being westward in the day and eastward in the night.

BERNICLA, in ornithology, the trivial name of a species of goose. See ANAS.

BERNICLE, in zoology, a species of lepas. See LEPAS.

BERNIER (Nicholas), an eminent musician and composer, was born at Mante on the Seine, in the year 1664. By his merit in his profession he attained to be conductor of the music in the chapel of St Stephen, and afterwards in that of the king. The regent duke of Orleans admired his works, and patronized their author. This prince having given him a motet of his own composition to examine, and being impatient for his observations thereon, went to the house of Bernier, and entering his study, found the abbe de la Croix there criticising his piece, while the musician himself was in another room carousing and singing with a company of his friends. The duke broke in upon and interrupted their mirth, with a reprimand of Bernier for his inattention to the task assigned him. This musician died at Paris in 1734. His five books of Cantatas and Songs for one and two voices, the words of which were written by Rousseau and Fufeler, have procured him great reputation. There are besides of his composition *Les Nuits de Sceaux*, and many motets, which are still in great esteem.

BERNIER (Francis), surnamed the *Mogul*, on account of his travels and residence in that country, was born at Angers in France; and after he had taken his degree of doctor of physic at Montpellier, left his country in 1654, went to Egypt, to the Holy Land, and to the kingdom of the Mogul, where he was physician to that monarch, attended him in his journeys, and stayed there 12 days. Upon his return to France, he published the history of the countries he had visited; and spent the remainder of his life in composing various other works, particularly an Abridgment of the Philosophy of Gassendus in 8 vols 12mo. His first work is esteemed to be the best account we have of the countries which are the subject of it.

BERNINI (John Laurence), commonly called *Cavaliero Bernin*, a Neapolitan, famous for his skill in painting, sculpture, architecture, and mechanics. He first began to be known under the pontificate of Paul V. Rome is indebted to this artist for some of its greatest ornaments; and there are in the church of St Peter no less than 15 different works of his hand. He died at Rome in 1680.

BERNO, abbot of Richenou, in the diocese of Constance, who flourished about the year 1008, is celebrated as a poet, rhetor, musician, philosopher, and divine. He was the author of several treatises on music, particularly of one *De Instrumentis Musicalibus*, beginning with the words *Muscam non esse contem!* which he dedicated to Arrabon archbishop of Mentz. He also wrote *De Mensura Monochordi*. But the most celebrated of his works is a treatise *De Musica seu Tonis*, which he wrote and dedicated to Pelegrines archbishop of Cologne, beginning *Vero mundi isti advena et peregrino*. This latter tract is part of the Baliol manuscript, and follows the Enchiridion of Odo: it contains a summary of the doctrines delivered by Boetius, an explanation of the ecclesiastical tones, intermixed with frequent exhortations to piety, and the application of music to religious purposes. He was highly favoured by the emperor Henry II. for his great learning and piety; and succeeded so well in his endeavours to promote learning, that his abbey of Richenou was as famous in his time as those of St Gaul and Cluni, then the most celebrated in France. He died in 1048; and was interred in the church of his monastery, which but a short time before he had dedicated to St Mark.

BERNOUILLI (James), a celebrated mathematician, born at Basil the 27th of December 1647. Having taken his degrees in the university of Basil, he applied himself to divinity, not so much from inclination as complaisance to his father. He gave very early proofs of his genius for mathematics, and soon became a geometrician, without any assistance from masters, and at first almost without books: for he was not allowed to have any books of this kind; and if one fell by chance into his hands, he was obliged to conceal it, that he might not incur the reprimands of his father, who designed him for other studies. This severity made him choose for his device, Phaeton driving the chariot of the sun, with these words, *Invito patre sidera verso*, "I traverse the stars against my father's inclination." This had a particular reference to astronomy, the part of mathematics to which he at first applied himself. But the precautions of his father did not avail, for he pursued his favourite study with great application. In 1666 he began his travels. When he was at Geneva,

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Bernouilli.

Bernouilli. he fell upon a method to teach a young girl to write, though she had lost her sight when she was but two months old. At Bourdeaux he composed universal gnomonic tables, but they were never published. He returned from France to his own country in 1680. About this time there appeared a comet, the return of which he foretold; and wrote a small treatise upon it, which he afterwards translated into Latin. He went soon after to Holland, where he applied himself to the study of the new philosophy. After having visited Flanders and Brabant, he went to Calais, and passed over from thence to England. At London he contracted an acquaintance with all the most eminent men in the several sciences; and had the honour of being frequently present at the philosophical societies held at the house of the famous Mr Boyle. He returned to his native country in 1682; and he exhibited at Basil a course of experiments in natural philosophy and mechanics, which consisted of a variety of new discoveries. In 1682, he published his essay of a new system of comets; and the year following, his dissertation on the weight of air. Mr Leibnitz, about this time, having published in the *Acta Eruditorum* at Leipzig some essay of his new *Calculus differentialis*, or *infinimens petits*, but concealed the art and method of it; Mr Bernouilli, and one of his brothers, discovered, by the little which they saw, the beauty and extent of it: they endeavoured to unravel the secret; which they did with such success, that Mr Leibnitz declared, that the invention belonged to them as much as to himself. In 1687, the professorship of mathematics at Basil being vacant, Mr Bernouilli was appointed his successor. He discharged this trust with universal applause; and his reputation drew a great number of foreigners from all parts to hear his lectures. He had an admirable talent in teaching, and adapting himself to the different genius and capacity of his scholars. In 1699, he was admitted into the academy of sciences at Paris as a foreign member, and in 1701 the same honour was conferred upon him by the academy of Berlin. He wrote several pieces in the *Acta Eruditorum* of Leipzig, the *Journal des Savans*, and the *Histoire de l'Academie des Sciences*. His assiduous application to his studies brought upon him the gout, and by degrees a slow fever, of which he died the 16th of August 1705, in the 58th year of his age. Archimedes having found out the proportion of a sphere to a cylinder circumscribed about it, ordered it to be engraven upon his monument. In imitation of him, Mr Bernouilli appointed, that a spiral logarithmical curve should be inscribed upon his tomb, with these words, *Eadem mutata resurgo*; in allusion to the hopes of the resurrection, which are represented in some measure by the properties of the curve which he had the honour of discovering.

BERNOUILLI (Daniel), a celebrated physician and philosopher, was born at Groningen, February 9th 1700. He was intended by his parents for trade, but his genius led him to different pursuits. He passed some time in Italy, and at 24 refused to be president of an academy meant to have been established at Genoa. He spent several years at St Petersburg with great credit; and in 1733 returned to Basil, where he successively filled the chair of physic, natural and speculative philosophy. In his first work, *Exercitationes Mathematicae*, he took the only title he then had, viz. "Son

of John Bernouilli," and never would suffer any other to be added to it. This work appeared in Italy with the great inquisitor's privilege added to it, and it classed Bernouilli in the rank of inventors. He gained or divided nine prizes, which were contended for by the most illustrious mathematicians in Europe, from the academy of sciences. The only man who has had success of the same kind is Euler, his countryman, disciple, rival, and friend. His first prize he gained at 24 years of age. In 1734 he divided one with his father: but this hurt the family union; for the father construed the contest itself into a want of respect; and the son did not sufficiently conceal that he thought (what was really the case) his own piece better than his father's. Besides this, he declared for Newton, against whom his father had contended all his life. In 1740, Mr Bernouilli divided the prize "On the Tides of the Sea" with Euler and Maclaurin. The academy at the same time crowned a fourth piece, whose only merit was that of being Cartesian; but this was the last public act of adoration paid by it to the authority of the author of the Vortices, which it had obeyed perhaps too long. In 1748, Mr Daniel Bernouilli succeeded his father in the academy of sciences, and was himself succeeded by his brother John; this place, since its first erection, i. e. 84 years, never having been without a Bernouilli to fill it. He was extremely respected at Basil; and to bow to Daniel Bernouilli, when they met him in the streets, was one of the first lessons which every father gave every child. He used to tell two little adventures, which he said had given him more pleasure than all the other honours he had received. He was travelling with a learned stranger, who, being pleased with his conversation, asked his name: "I am Daniel Bernouilli," answered he, with great modesty; "And I," said the stranger (who thought he meant to laugh at him), "am Isaac Newton." Another time he was giving a dinner to the famous Koenig the mathematician, who boasted, with a sufficient degree of self-complacency, of a difficult problem he had resolved with much trouble. Bernouilli went on doing the honours of his table; and, when they went to drink coffee, presented him with a solution of the problem more elegant than his own. He died in March 1782.

BEROEIA (anc. geog.), a noble city of Macedonia, to the south of Edessa, or *Ægæ*, and south-east of Cyrtus. The people are commended in Scripture for their reception of the Gospel on a fair and impartial examination.—Another *Beroea* of Syria (Stephenus); called also *Beroe*, and by the inhabitants *Beroia*. It is the standing tradition for some ages, that it is the modern Aleppo; called *Chalep* in Nicetas, Nicephorus, and Zonaras; from which it is supposed the present appellation *Aleppo* is derived; distant 90 miles from the Levant Sea and the port of Scanderoon, and about 100 miles west of the Euphrates. E. Long. 36. 0. N. Lat. 36. 30.

BEROOT, or **BAIROUT**, a town of Phœnicia, a province of Syria in Turkey in Asia. It is the ancient Berytus; but there are now no remains of its former beauty, except its situation. It stands in a plain, which from the foot of Lebanon runs out into the sea, narrowing to a point, about two leagues from the ordinary line of the shore, and on the north side forms a pretty long road, which receives the river of Nahr-el-

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Salib, called also *Nahr-Bairout*. This river has such frequent floods in winter, as to have occasioned the building of a considerable bridge; but it is in so ruinous a state as to be impassable. The bottom of the road is rock, which chafes the cables, and renders it very insecure. From hence, as we proceed westward towards the point, we reach, after an hour's journey, the town of Bairout. This belonged to the Druzes, till lately that it was taken from them, and a Turkish garrison placed in it. Still, however, it continues to be the emporium of the Maronites and the Druzes, where they export their cottons and silks, almost all of which are destined for Cairo. In return, they receive rice, tobacco, coffee, and specie, which they exchange again for the corn of the Bekaa and the Hauran. This commerce maintains near 6000 persons. The dialect of the inhabitants is justly censured as the most corrupt of any in the country: it unites in itself the 12 faults enumerated by the Arabian grammarians. The port of Beroot, formed like all the others on the coast by a pier, is like them choaked up with sand and ruins. The town is surrounded by a wall, the soft and sandy stone of which may be pierced by a cannon-ball without breaking or crumbling; which was unfavourable to the Russians in their attack: but in other respects this wall, and its old towers, are defenceless. Two inconveniences will prevent Beroot from ever becoming a place of strength; for it is commanded by a chain of hills to the south-east, and is entirely destitute of water, which the women are obliged to fetch from a well at the distance of half a quarter of a league, though what they find there is but indifferent. By digging in order to form reservoirs, subterraneous ruins have been discovered; from which it appears, that the modern town is built on the ancient one. The same may be observed of Latakia, Antioch, Tripoli, Saide, and the greater part of the towns on the coast, which have been occasioned by earthquakes that have destroyed them at different periods. We find likewise, without the walls to the west, heaps of rubbish, and some shafts of columns, which indicate that Beroot has been formerly much larger than at present. The plain around it is entirely planted with white mulberry trees, which are young and flourishing; by which means the silk produced here is of the very finest quality. In descending from the mountains (says M. Volney), no prospect can be more delightful than to behold, from their summits or declivities, the rich carpet of verdure formed by the tops of these useful trees in the distant bottom of the valley. In summer, it is inconvenient to reside at Beroot on account of the heat and the warmth of the water: the town, however, is not unhealthy, though it is said to have been so formerly. It has ceased to be unhealthy since the Emir Fakr-eldin planted a wood of fir trees, which is still standing a league to the southward of the town. E. Long. 35. 38. N. Lat. 34. 18.

BEROSUS, priest of the temple of Belus at Babylon, in the time of Ptolemy Philadelphus, wrote the History of Chaldea, which is often cited by the ancients, and of which Josephus gives some curious fragments. The Athenians, according to Pliny, caused his statue, with a golden tongue, to be placed in their Gymnasium.

BERRE, a town of Provence in France, seated on

a lake of the same name. It is remarkable for the quantity and goodness of the salt that is made there, but the air is very unwholesome. E. Long. 4. 32. N. Lat. 43. 32.

BERRETINI DA CORTONA (Pietro), painter of history and landscape, was born at Crotona in 1596; and, according to some writers, was a disciple of Andrea Comodi; though others affirm that he was the disciple of Baccio Ciampi, and the author of the Abrege says he was successively the author of both: but he is allowed to have been as great and as enlarged a genius as any of his profession, and to have painted more agreeably than most of the artists who were his contemporaries. He went young to Rome, and applied himself diligently to study the antiques, the works of Raphael, Buonaroti, and Polidoro; by which he so improved his taste and his hand, that he distinguished himself in a degree superior to any of the artists of his time. He worked with remarkable ease and freedom; his figures are admirably grouped; his distribution is truly elegant; the chiaro-scuro is judiciously observed; and through his whole compositions there appears uncommon grace: but De Piles observes, that it was not such a grace as was the portion of Raphael and Correggio; but a general grace, consisting rather in a habit of making the airs of his heads always agreeable, than in a choice of expressions suitable to each subject. In his large compositions, the colouring had a good effect; but his colouring in fresco is far superior to what he performed in oil: nor do his easel pictures appear as finished as might be expected from so great a master, when compared with what he painted in a larger size. By the best judges it seems to be agreed, that although this master was frequently incorrect; though not always judicious in his expressions; though irregular in his draperies, and apt to design his figures too short and too heavy; yet, by the magnificence of his composition, the delicate airs of his figures, the grandeur of his decorations, and the astonishing beauty and gracefulness of the whole together, he must be allowed to have been the most agreeable mannerist that any age hath produced.—He died in 1669. Some of his most capital works are in the Barberini palace at Rome, and the Palazzo Pitti at Florence.

BERRETONI (Nicolo), history-painter, was born at Macerata in 1617, and was a disciple of Carlo Maratti, with whom he studied design and colouring for some years; and attained such excellence, that he excited even the jealousy and envy of his master, who seemed to be apprehensive of finding a powerful competitor and rival in his pupil.—His early works, after he quitted the school of Maratti, were in the style and taste of Guido; and they could not possibly have a more high encomium or recommendation. He died in 1682.

BERRIMAN (Dr William), was the son of Mr John Berriman apothecary in Bishopsgate-street, London, where he was born in 1688. He studied at Oriel-college, Oxford, where he took his several degrees, and became curate and lecturer of All-hallows in Thames-street, and lecturer of St Michael's, Queenhithe. In 1720, he was appointed domestic chaplain to Dr Robinson bishop of London, who soon after collated him to the living of St Andrew's Undershaft; and in 1727, he was elected fellow of Eton-college. He died

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Berriman.

Berry,
Berfabe.

in 1750, in the 62d year of his age. He wrote, 1. A seasonable Review of Mr Whiston's Account of Primitive Doxologies. 2. An Historical Account of the Trinitarian Controversy, in eight sermons, at Lady Moyer's lecture. 3. Brief Remarks on Mr Chandler's Introduction to the History of the Inquisition. 4. Sermons at Boyle's lectures, 2 vols 8vo. 5. Christian Doctrines and Duties explained and recommended, in 2 vols 8vo; and other works.

BERRY. See BACCA.

BERRY, a province of France, with the title of a duchy. It is bounded on the north, by Solome; on the south, by Marche; on the east, by Nivernois and Bourbonnoise; and on the west, by Touraine. It is 90 miles in length from north to south, and 73 in breadth from east to west. The air is very temperate; and the soil produces wheat, rye, and wine little inferior to Burgundy; that of Sancerre, St Satur, and Lavernusse, is the best. The fruits are in plenty, and pretty good. The pastures are proper to fatten sheep. This country produces also a good deal of hemp and flax. There are mines of iron and silver, but they are neglected. The stone quarries, within half a league of Bourges, are very serviceable. In the parish of St Hilare there is a mine of oker, made use of in melting metals and for painting. Near Bourges there is a cold mineral spring, which has a clammy fat pellicle over it every morning of different colours. It lets fall a fine black smooth sediment, which has the same smell, and almost the same taste, as gunpowder, which makes some conclude it partakes of sulphur, vitriol, and oker. The pellicle is as thick as a crown-piece; and when put on a red-hot fire-shovel, will bounce and sparkle, as will also the sediment. It is certain there is saltpetre in these waters, though vitriol seems to be the most predominant. These waters, drank on the spot, temperate the heat of the blood and humours, open obstructions, and strengthen the fibres. Berry is watered by several rivers; the principal of which are the Loire, the Creuse, the Cher, the Indre, the Orron, the Evre, the Aurette, the Maulon, the Great and Little Saudre, the Nerre, &c. Near Liniers, there is a lake 20 miles round. Berry is divided into the Upper and the Lower, and Bourges is the capital city. The inhabitants of Bourges carry on a small trade with corn down the Loire; but that of the wine above mentioned is much more considerable, it being transported to Paris by means of that river and the canal of Briare. But the principal commerce consists in the fat cattle which they send to Paris, and the great number of sheep; these last bear fine wool, which is used in the manufactures of this province and other parts of the kingdom. There are two sorts of manufactures in Berry; the one for cloths and serges, and the other for knit and wove stockings. There is likewise a great quantity of hemp, which is transported elsewhere; for they have not yet got the art of manufacturing it themselves. At Aubigny there are 2000 persons generally employed in the making of cloth.

BERSABE (anc. geog.), a town in the tribe of Simeon (Joshua); the south boundary not only of its own tribe, but of the whole land of Israel, as appears from the common expression "from Dan to Berfabe." In our translation it is Beer-Sheba. It was the residence of the patriarchs; as first of Abraham, from whom it took its name, and of Isaac. It signifies the

well or fountain of the oath; dug by Abraham, and claimed as his property by covenant and the religion of an oath, against the insults of the Philistines. Eusebius and Jerome say, that there was a citadel and large village of that name in their time. It was called *Beersheba of Judah* in 1 Kings xix 3. not to distinguish it from the Beersheba of Galilee, which probably did not then exist, but to ascertain the limits of the king of Judah. In the lower age called *Castrum Versabini*.

BERSARII, in writers of the middle age, a kind of hunters or sportsmen, who pursued wild beasts in forests and chaces. The word seems derived from the barbarous Latin *bersare*, "to shoot with a bow;" on which principle it should properly denote archers only, or bowmen. Or it might be derived from *berfa*, "the fence or pales of a park;" in which view, it should primarily import those who hunt or poach in parks or forests.

Hincmar speaks of a kind of inferior officers in the court of Charlemagne, under the denomination of *bersarii*, *veltrarii* and *beverarii*. Spelman takes the first to denote those who hunted the wolf; the second, those who had the superintendency of the hounds for that use; and the third, those who hunted the beaver.

BERSELLO, a fortified town of Italy in the Modenese. It was taken by Prince Eugene in 1702; and by the French in 1703, who were obliged to abandon it in 1707. It is seated near the confluence of the rivers Linza and Po, in E. Long. 10. 30. N. Lat. 44. 55.

BERSUIRE, a town of France in Lower Poitou. W. Long. 0. 27. N. Lat. 46. 52.

BERTINERO, a town of Romagna in Italy, with a strong citadel. It is the see of a bishop; and is seated on a hill, in E. Long. 11. 47. N. Lat. 44. 8.

BERTRAND (St), an episcopal town in France in Gascony, and capital of the country of Comminges. E. Long. 0. 38. N. Lat. 43. 2.

BERVY, a sea-port and parliament town in the county of Mearns in Scotland. W. Long. 2. 0. N. Lat. 56. 40.

BERWICK (the duke of), was natural son of James II. by Mrs Arabella Churchill, sister to the great duke of Marlborough. He followed the fate of his father, and came into France after the revolution with James II. Here the duke of Berwick was recommended to the court by his superior merit. He was created marshal of France, knight of the Holy Ghost, duke and peer of France, grandee of Spain, commander in chief of the French armies; in all which stations his behaviour was such, that few equalled, perhaps none surpassed, him. He lived in an age when the renowned prince of Orange and many other of the greatest men commanded against him. His courage was of the cool steady kind; always possessing himself; taking all advantages; not foolishly, rashly, or wantonly throwing away the lives of his soldiers. He kept up on all occasions the most strict discipline; and did not spare punishment among his soldiers for marauding and other crimes, when properly deserved; for which some inconsiderate people have blamed him. He has been reflected upon by the very zealous and violent adherents of the Stuart family for not being sufficiently attached to that party, which was his own family. But by a cool examination of his actions, it will appear, that his behaviour in this particular

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Berwick.

Berwick

ticular was, as in most parts of his life, sensible and just. When he accepted of employments, received honours, dignities, and became a naturalized Frenchman, he thought it his duty, as an honest man, to become a Frenchman, and a real subject to the monarch who gave him bread; and to be, or not to be, in the interest of the Stuart family, according to the will and commands of the sovereign whom he served, and in the interest of France according to time and circumstances; for there is no serving two masters well. But when ordered by his king to be in that family's interest, he acted with the greatest sincerity; and took the most effectual and sensible methods to serve that unhappy house, as the following anecdote, if true, and it has great appearance and probability on its side, proves. The Duke of Marlborough, after the signing of the treaty of Utrecht, was censured by the British parliament for some of the army contracts in relation to bread and forage; upon which he retired into France: and it was then credibly asserted, the Duke of Marlborough was brought over to the interest of the Stuart family; for it is now past a doubt, that Queen Anne had a very serious intention of having her brother upon the throne of England after her death: and several circumstances, as well as the time of that Duke's landing in England, make many people believe he was gained over to the Stuart party. If the Duke of Berwick was, directly or indirectly, the means of gaining his uncle over to that interest, he more effectually served it than that rash mock army of unhappy gentlemen who were taken prisoners at Preston in 1715 had it in their power to do. In a word, the Duke of Berwick was, without being a bigot, a moral and religious man; and showed by his life and actions, that morality and religion are very compatible and consistent with the life of a statesman and a great general; and if they were oftener united in those two professions, it would be much happier for the rest of mankind. He was killed by a cannon-ball at the siege of Philippsburgh in 1738.

BERWICK, one of the best cultivated counties in Scotland; bounded by the river Tweed, on the south; by Lothian, on the north; by the German Ocean, on the east; and by Tiviotdale, on the west. It abounds with corn and grass, and has in it several seats of persons of quality. The principal rivers are the Tweed, the Whiteater, Blackadder, Eye, and Ednel. The chief place is the town and castle of Dunse. Eyemouth is the sea-port, where a great deal of grain is shipped. Lauder is the only royal borough, though Greenlaw is the county-town. It sends one member to parliament.

BERWICK (North), a royal borough and sea-port in the county of East Lothian in Scotland. W. Long. 2. 29. N. Lat. 5. 56.

BERWICK-upon-Tweed, is a town on the borders of England and Scotland, and a county of itself. It stands on the north or Scottish side of the river Tweed; and is pleasantly situated on an easy declivity, almost close to the sea. It has a ditch on the north and east; but on the south and west it has high walls, regularly fortified, and planted with cannon, and to which the river serves as a moat. The houses are generally well built; and the town-house is a handsome structure, with a lofty turret, in which are eight bells, and a fine clock which tells the quarters, with four dials, one on each

side the square. The church is a neat building, but has no bells. The bridge is 947 feet long, and is supported by fifteen arches. The barracks form a large regular square, and will hold two regiments of foot very conveniently. The town is governed by a mayor, recorder, town-clerk, and four bailiffs; and has a coroner, a treasurer, four serjeants at mace, and a water bailiff. It had a strong castle, which now lies quite in ruins. It has a market on Saturdays, extremely well supplied; and a fair on Friday on Trinity-week for black cattle and horses. Corn and eggs are shipped from hence for London and other ports; but the principal trade is the salmon which are caught in the Tweed, and reckoned to be as good as any in the kingdom. Some are sent alive, and some pickled in kits by persons who subsist on that employment, and are called *salmon coopers*. The living is a rectory, rated at 20 l. a-year in the king's books. Though this town is not admitted to be either in England or Scotland, the English judges hold assizes here; and it is subject to the bishop of Durham. It sends two members to parliament. W. Long. 1. 35. N. Lat. 55. 58.

BERY, or BURY, the vill or seat of habitation of a nobleman, a dwelling or mansion house, being the chief of a manor: from the Saxon *beorg*, which signifies a *hill* or *castle*; for heretofore noblemens seats were castles situated on hills, of which we have still some remains; as in Herefordshire there are the *beries* of Stockton, Hope, &c. It was anciently taken for a sanctuary.

BERY. See BERIA.

BERYL, in natural history, called by our lapidaries *aqua marina*, is a pellucid gem of a bluish green colour, found in the East Indies and about the gold mines of Peru: we have also some from Silesia, but what are brought from thence are oftener coloured crystals than real beryls; and when they are genuine, they are greatly inferior both in hardness and lustre to the oriental and Peruvian kinds.

The beryl, like most other gems, is met with both in the pebble and columnar form, but in the latter most frequently. In the pebble form it usually appears of a roundish but flatted figure, and commonly full of small flat faces, irregularly disposed. In the columnar or crystalline form it always consists of hexangular columns, terminated by hexangular pyramids. It never receives any admixture of colour into it, nor loses the blue and green, but has its genuine tinge in the degrees from a very deep and dusky to the palest imaginable of the hue of sea-water.

The beryl, in its perfect state, approaches to the hardness of the garnet, but is often softer; and its size is from that of a small tare to that of a pea, a horse-bean, or even a walnut. It may be imitated by adding to 20 pounds of crystal-glass made without magnesia, six ounces of calcined brass or copper, and a quarter of an ounce of prepared zaffre.—The properties of the beryl were very wonderful in the opinion of the ancient naturalists: it kept people from falling into ambuscades of enemies, excited courage in the fearful, and cured diseases of the eyes and stomach. It does none of these things now; because people are not simple enough to believe it has the virtue to do them.

BERYL-crystal, in natural history, a species of what Dr Hill calls *ellipomacrostylia*, or imperfect crystals, is of

Bery,
Beryl.

Berytus
||
Befancon.

of an extreme pure, clear, and equal texture, and scarce ever subject to the slightest films or blemishes. It is ever constant to the peculiarity of its figure, which is that of a long and slender column, remarkably tapering towards the top, and very irregularly hexangular. It is of a very fine transparence, and naturally of a pale brown; and carries such evident marks of distinction from all brown crystals, that our lapidaries call it, by way of eminence, the *beryl-crystal*, or simply the *beryl*.

BERYTUS (anc. geog.), a sea-port town of Phœnicia on the Mediterranean, so ancient as to be thought to have been built by Saturn. It was destroyed by Tryphon, but rebuilt by the Romans. Agrippa placed here two legions, whence it became a colony. It enjoyed the *jus Italicum*, and had an excellent school for the study of the law in Justinian's time. Now BEROOT; which see.

BES, or BESSIS, in Roman antiquity, two-thirds of the as. See AS.

BES also denotes two-thirds of the jugerum. See JUGERUM.

BESAILE, signifies the father of a grandfather.

BESAILE, in law, a writ that lies where the great-grandfather was seized in fee of any lands, &c. at the time of his death; and after his decease a stranger enters thereon the same day, and keeps out the heir.

BESANCON, a city of France, capital of the Franche Compté, and one of the most ancient cities of Europe. It is the see of an archbishop, and has a parliament as well as an university. It is seated on the river Dreux, which divides it into two parts, the greatest of which is a peninsula. The entrance is shut up by a mountain, on which they have built a large citadel, which commands all the city. There are many names of places in and about the city, that are plainly corruptions of the Latin, and are marks of its antiquity, as Chamars, Campus Martis, Chamusc, Campus Musarum, Chandane, Campus Dianæ, &c. The metropolitan church is built at the bottom of St Stephen's hill; and is a very handsome structure with a high tower steeple. The great altar is placed in the middle choir, where on high days they expose reliques in silver shrines, enriched with gold and jewels. There are several tombs and other things remarkable in the churches; and after you have past the church of Notre Dame, and the square that it looks into, you come to a triumphal arch, erected in honour of the emperor Aurelian, on which are several figures of men and animals pretty entire. It serves as a gate to the cloister to St John the Great. The great hospital of the order of the Holy Ghost is a structure worth seeing. The streets are wide and handsome; and the houses are well built with free-stone, and covered with slate, chiefly about the square called *Battan*, which is adorned with a fountain, the water of which proceeds from the statue of Bacchus. The river Dreux is passed over on a stone bridge, to enter from one part of Befancon into the other. The market-place is at the entrance; and on the left is another square, adorned with a fountain, where the great street begins, which traverses all this part from the bridge to St John the Great. The new square is not far from this street, from whence you go to the town-house, which is a large structure with four wings,

before the front of which is the statue of Charles V. in bronze, with a globe in one hand and a sword in the other. The Imperial eagle is raised over a large basin, and spouts out water by both his beaks. The governor's palace is the most magnificent in the province, and there is a fountain a little farther, adorned with the figure of a naked woman, with water springing out at her nipples. E. Long. 6. 10. N. Lat. 47. 26.

BESANT, or BEZANT, a coin of pure gold, of an uncertain value, struck at Byzantium, in the time of the Christian emperors; from hence the gold offered by the king at the altar is called *besant* or *bisant*.

BESANTED, or BEZANTED. This word means *full of besants*; and is used to denote a field, ordinary, or charge, covered with above eight besants: for if there be but eight or fewer, their number must be particularly mentioned.

BESELEEL and OOLIAH, architects, sculptors, and painters, supposed to have made all the ornaments in brass, silver, &c. of the first tabernacle in the wilderness, 1490 B. C.

BESIERS, or BEZIERS, an ancient and handsome town of France, in Lower Languedoc, with a bishop's see, and the title of a viscounty. It has a delightful situation; and the country in which it stands is fertile in corn, oil, and produces excellent wine. It is seated on a hill near the river Orbe, in E. Long. 3. 23. N. Lat. 43. 21.

BESISTAN, or BERSTEIN: Thus at Constantinople, Adrianople, and in some other towns within the Grand Signior's dominions, they call those places where the merchants have their shops, and expose their merchandizes to sale. Each sort of merchants have their particular besistan, which must also be understood of the workmen, all those of the same trade working in the same place. These besistants are commonly large galleries vaulted over, whose gates are shut every night. Sometimes the wardens and keepers of the besistants will answer for the merchandizes, on paying them a very moderate perquisite for every shop.

BESLERIA (from Basilius Besler an apothecary at Nuremberg, author of a book, intitled, *Hortis Eystetensis*), a genus of the angiospermia order, belonging to the didynamia class of plants. Of this genus there are three species; the *melittifolia*, with branching footstalks and oval leaves; the *lutea*, with simple footstalks growing in clusters, and spear-shaped leaves; and the *cristata*, with stalks growing single, and a five-leaved involucre. All these are natives of the warm parts of America, and cannot be preserved in this country without artificial heat. But as they are remarkable neither for beauty nor any other property, we forbear any particular description.

BESORCH, a coin of tin, or some alloyed metal, current at Ormus, at the rate of $\frac{7}{12}$ parts of a farthing Sterling.

BESOZZI, or BEZUTIUS (Ambrogio), a painter of considerable eminence, was born at Milan in 1648. He worked some time under Gioseffo Danedi, called *Montalti*: he afterwards went to Rome, where he studied from the antiques and the pictures of the greatest masters; and at last perfected himself in the school of Ciro Ferri. His great excellency consisted in painting architecture, friezes, imitations of bas-relievs, and other

Besant
||
Besozzi.

Bessarabia other decorations. He died at Milan in 1706, aged 58 years.

||
Bessica.

BESSARABIA, a territory of Turkey in Europe, lying between Moldavia, the Danube, the Black Sea, and Little Tartary. It is inhabited by independent Tartars, who maintain themselves by their cattle, husbandry, and by robbery. Their religion, manners, and customs, are the same of those with the Crim Tartars. When there are any forces sent against them, they retire among the mountains near the Black Sea, where it is impossible to come at them on account of the morasses and defiles.

BESSARION, titular patriarch of Constantinople and archbishop of Nice, and one of those illustrious persons who contributed to the resurrection of letters in the 15th century, was born at Trebisonde. He was very zealous to reunite the Greek with the Latin church, and engaged the emperor John Paleologus to interest himself in bringing this great work about. He passed into Italy, appeared at the council of Florence, harangued the fathers, and made himself admired as well by his modesty as by his uncommon abilities. The Greek schismatics conceived so mortal an aversion to him, that he was obliged to remain in Italy; where pope Eugenius IV. honoured him with the purple in 1439. He fixed his abode at Rome, and would have been raised to the Papal chair, if cardinal Alain had not opposed it, as injurious to the Latin church to choose a Greek however illustrious. He was employed in several embassies, but that to France proved fatal to him. When legate at this court, he happened to visit the duke of Burgundy, before he saw Louis XI. which so disconcerted the capricious haughty monarch, as to occasion him a very ungracious reception. Nay, the king even took the cardinal legate by his most magnificent beard, saying in his fine Latin, *Barbara Graca genus retinent quod habere solebant*: and this affront so chagrined the cardinal, as to occasion his death at Ravenna upon his return in 1472. This at least is what Matthieu relates in his History of Louis XI. Bessarion loved the literati, and protected them. Argyropilus, Theodore of Gaza, Poggius, Laurentius Valla, &c. formed in his house a kind of academy. His library was large and curious; and the senate of Venice, to whom he gave it, preserve it to this day with attention and regard. He left some works, which rank among those that helped to revive letters; as, *Defensio Doctrinae Platonicae*, &c. Translations of some Pieces of Aristotle. Orations, Epistles, &c.

BESSICA (anc. geog.), a district of Thrace towards mount Hæmus to the south of the Hebrus. It was inhabited by a fierce and barbarous people noted for their robberies. Their chief city Uscudama is now known by the name of *Adrianople*. They lived under their own king till the consulate of M. Licinius Lucullus and C. Cassius Varus; when the consul Lucullus invaded their country, and having gained a great victory over them, took their metropolis, and subjected the whole nation to the Roman laws. The Romans, notwithstanding they had subdued them by force of arms, still suffered them to live under their own kings; for Piso, while he governed Macedon in quality of proconsul, having treacherously seized Rabocentus, whom Suetonius calls *prince of the Bessi*, caused him to be publicly beheaded. This affront so exasperated the

whole nation that they revolted; but were overthrown in a great battle by Octavius the father of Augustus. During the civil wars of Rome they attempted anew to recover their liberty, but were again defeated by the famous M. Brutus. In the reign of Augustus one Vollogesus, a native of the country, and priest of Bacchus, having, under pretence of religion, drawn together great crowds of people, made himself master of the whole country; and entering the Chersonesus, committed there the most dreadful ravages. He was at last, however, overcome by L. Piso; who obliged the savage inhabitants to lay down their arms, and submit to such conditions as he was pleased to impose upon them. From this time the Bessi continued subject to the Romans without attempting any more to regain their liberty.

BESSIS. See BES.

BESTAIL, or **BESTIAL**, in ancient statutes, all kinds of beasts or cattle, especially those purveyed for the king's provision.

BESTIARII, in Roman antiquity, such as fought against beasts, or those who were exposed to them by sentence of the law. There were four kinds of bestiarii: the first were those who made a trade of it, and fought for money; the second were such young men as, to show their strength and dexterity in managing their arms, fought against beasts; the third was, where several bestiarii were let loose at once, well armed, against a number of beasts; and the fourth kind were those condemned to the beasts, consisting either of enemies taken prisoners in war, or as being slaves, and guilty of some enormous crime; those were all exposed naked, and without defence.

BESTRICIA, a town of Transylvania, remarkable for the gold mines in its neighbourhood. E. Long. 22. 5. N. Lat. 48. 0.

BETA, the **BEET**: A genus of the digynia order, belonging to the pentandria class of plants; and in the natural method ranking under the 12th order, *Holoraceae*. The calyx has four leaves; there is no corolla; the seeds are kidney-shaped, and situated within the base of the calyx.

Species. 1. The *maritima*, or sea-beet, grows naturally by the sea-side, and in salt marshes, in many parts of England, as also on the Bass island at the mouth of the Forth in Scotland. It has been supposed by many to be only a variety of the common white beet; but Mr Miller assures us he has been unable to make any variation in them by culture. 2. The *hortensis*, or common white beet, is cultivated in gardens for the sake of its leaves which are frequently used in soups. The root of this sort seldom grows larger than a man's thumb; the spikes of flowers come out from the wings of the leaves, which are long, and have narrow leaves placed between the flowers. The lower leaves of the plant are thick and succulent, and their footstalks broad. The varieties of this are, the white beet, the green beet, and the Swiss or chard beet. These will vary from the one to the other, but have never been found to change to the first or third sort. 3. The *vulgaris*, or red beet, with a pyramidal root, hath large, thick, succulent leaves, which are for the most part of a dark-green or purple colour. The roots of this are large, and of a deep red colour. The larger these roots grow, the tenderer they are; and the deeper.

Bessis
||
Beta.

Beta
||
Betelfagui.

deeper their colour, the more they are esteemed. The varieties of this species are, the common red beet, the turnip-rooted beet, and the green-leaved red beet. 4. The cicla, or root of scarcity; for which see AGRICULTURE, n° 52.

Culture. The common white beet is commonly sown by itself in the beginning of March, upon an open spot of ground, not too moist. When the plants have put out four leaves, the ground should be hoed as is practised for carrots, carefully cutting up all the weeds, and also the plants where they are too near each other, leaving them at least six inches asunder. In three weeks or a month's time the ground should be hoed a second time to cut up the weeds and thin the plants to a greater distance, for by this time they will be out of danger; so should not be left nearer than eight or nine inches, if regard is had to the goodness of the leaves; and if it is of the Swiss kind, with broad leaves, the plants must not be nearer than a foot. In six weeks after, the ground should be hoed over a third time, which if properly done will destroy all the weeds. After this the plants will spread and prevent the weeds from growing, therefore will want but little cleaning for a considerable time, and the leaves will soon be fit for use. The outer larger leaves should be first gathered, leaving the smaller inner ones to grow large; by which method a small spot of ground will supply a moderate family for a whole year, provided the plants are not allowed to run to seed, for in that case they will not be good.

The red beet is frequently sown with onions, carrots, or parsnips; but if these are not to be soon removed, the beets ought to be sown by themselves. This sort requires a deep light soil; the seeds should be sown in March, and must be treated in the same manner as the former sort: but the plants should not be left nearer than a foot distance, or in a good land a foot and a half; for the leaves will cover the ground at that distance. The roots will be fit for use in autumn, and continue good all winter; but in the spring, when they begin to shoot, they will be hard and stringy.

Medicinal and other uses. Decoctions of beets gently loosen the belly; hence they have been ranked among the emollient herbs: the plants remaining after the boiling are supposed to have rather a contrary effect. They afford little nourishment, and are said by some to be prejudicial to the stomach. The juice expressed from the roots is a powerful errhine. The root of the red beet is sometimes used to improve the colour of claret; and Mr Margraff found that good sugar might be produced from the roots of the white kind by the methods practised abroad for procuring it from the sugar cane. By some it is recommended to cultivate the white beet in large quantities as food for cattle. See AGRICULTURE, n° 51.

BETANZOS, a town of Galicia, in Spain, seated on the Mandeo, and a bay of the sea, in W. Long. 7. 50. N. Lat. 43. 21.

BETEL, or BEETLE, in botany, an Indian plant (a species of PIPER), of great use and esteem in the east, where it makes a considerable article of commerce. See PIPER.

BUTELFAGUI, a town of Asia, in Arabia Felix, famous for the vast quantity of coffee bought and sold there; being the mart where the country people bring

their coffee to sell; and where the Europeans come, or send their factors or brokers, to purchase it. E. Long. 57. 20. N. Lat. 15. 40.

BETHABARA (anc. geog.), a term denoting a passage; and therefore by many referred to the passage at Jericho, where the Israelites passed over dry-shod; by Lightfoot, to the passage at Scythopolis; but Cellarius refers it to the mid-way between both; because there were doubtless several passages or fords on the Jordan. Here John is said to have baptized on the other side Jordan, (Evangelists).

BETHAGLO, or BETH-HAGLA (anc. geog.), a town of the tribe of Benjamin (Joshua xviii. 21.). In Jerome's time there was a village called *Agla*, ten miles from Eleutheropolis, towards Gaza, and supposed to be Bethagla.

BETHANY (anc. geog.), a village at the foot of mount Olivet, on the east side, about two miles to the east of Jerusalem, (John, Jerome); where Lazarus dwelt and was raised from the dead, and where happened the ascension of our Saviour.

BETHARAMPHTHA (anc. geog.), a town of Galilee, (Ptolemy); of the Peraea, (Josephus); which being walled round by Herod Antipas, was called *Julias*, after Julia, the daughter of Augustus, and consort of Tiberius: it stood to the north of the lake of Gennesareth, at the influx of the Jordan into that lake; and here Dr Well's places Bethsaida.

BETHARAN (anc. geog.), a town of the Peraea, or on the other side Jordan. said to be called *Livias*, or *Libias*, in the Greek manner, by Herod in honour of Livia, (Eusebius, Jerome); and of the same latitude almost with Jerusalem, (Ptolemy); called *Julias* by Josephus, who always calls the Livia of Augustus *Lia*.

BETHAVEN (anc. geog.), a town in the tribe of Ephraim, and a name given Bethel by Hosea, after the establishment of the idolatry of Jeroboam there; meaning it to have become the house of iniquity, from being the house of God: but Bethaven was a distinct town (Joshua vii. 2.) to the south-east of Bethel.

BETHEL (anc. geog.), a city of Samaria, on the borders of the tribe of Benjamin, anciently called *Luz*, (Moses); but they seem to be distinguished, (Joshua xvi. 2.) They were, however, contiguous places. Bethel was properly the place of Jacob's vision; and Luz, or Lus, an adjoining town, afterwards called *Bethel*, the former name being lost in that of *Bethel*. It was twelve miles to the north-east of Jerusalem, (Jerome); and called *Bethaven*, (Hosea).

BETHESDA, (called in the Greek, *κολυμβητρα προβατικη*, and thence in the Vulgate *Piscina Probatica*, because, according to some, the sheep were washed in it, which were appointed for sacrifices), was the Hebrew name for a pool or public bath, which had five porticos, piazzas, or covered walks around it. This bath, for its singular usefulness, was called Bethesda, בית חסדה, *Beth Chesda*, or the *house of Mercy*, because, as Pool in his Annotations observes, the erecting of baths was an act of great kindness to the common people, whose indispositions in hot countries required frequent bathing. However, some will have the word Bethesda to be בית אשר, or the *sink-house*, or *drain*, because the waters which came from the temple, and the place where the victims were washed, flowed thither. From the Greek word *κολυμβητρα* being used

Bethabara
||
Bethesda.

Bethesda by Josephus (*Antiq.* xv. 3.) to denote the baths at Jericho, Mr Macknight, in his *Harmony of the Gospels*, concludes that their opinion seems to be without a proper foundation who affirm, that this pool served for washing the sheep designed for sacrifice before they were driven into the temple, and for washing the entrails of the beasts sacrificed there: besides, he thinks it inconsistent with the situation of Bethesda, *near the sheep-gate* (or *market* as our English translators have rendered the Greek *ἐπὶ τῇ προβατικῇ κολυμβήτρᾳ*, though some copies have it, *ἐν τῇ*, &c.) in the south-east wall of the city; or, according to the compilers of the *Universal History*, in that which was on the north-east, a great way from the temple. However this may be, we are told (*John* v. 2, 3, &c.) that in the porticoes of this bath, at the time of a certain feast (which is generally supposed to have been the passover), there lay a multitude of impotent folk, such as the blind, halt, and withered, waiting for the moving of the water: for an angel went down at a certain season into the pool, and troubled the water; that is, moved it in a sensible manner. Whosoever then first, after the troubling of the water, stepped into it, was made whole of whatever disease he had. Some writers confine the miracle of the pool of Bethesda to the season of this particular feast mentioned in verse 1. of this chapter, because they understand *κατὰ καιρὸν* by *times* (verse 4.), which our translators render, *a certain season*, meant *at that season*; that is, the season mentioned verse 1.; and since the evangelist does not say that the water of Bethesda had their sanative quality at any other feast, we are at liberty to make what supposition seems most convenient. Perhaps the silence of Philo and Josephus upon this miracle may induce some to think that it happened only at one passover; for though many infirm people lay in Bethesda, if the angel, as is probable, descended frequently during that solemnity, the miracle would be no sooner known, than multitudes would come and wait at the pool to be cured by the moving of the waters: however, if the number of the sick who gathered on this occasion, and the phrase *κατὰ καιρὸν*, shall incline any person to believe that the waters of Bethesda had an healing quality at other passovers also, Dr Macknight observes, that the silence of the writers before mentioned needs not be much regarded; it being well known that they have omitted greater transactions which they had an opportunity to know, viz. that multitude and variety of miracles which our Lord performed in the course of his ministry. That the waters of Bethesda should at this time have obtained a miraculous healing quality was, without doubt, as that writer remarks, in honour of the personal appearance of the son of God on earth. Perhaps it was intended to show that Ezekiel's (xlvi.) vision of waters issuing out of the sanctuary was about to be fulfilled, of which waters it is said, (*ib.* verse 9.) "They shall be healed, and every thing shall live whither the river cometh." But it must be observed, that the fourth verse of this chapter of St John is not in the Cambridge MSS. which formerly was Beza's, nor in one or two more of great authority. See Dr Mill's judgment of it in that part of his *Prolegomena* to which he refers the reader in his note on the text. But though it should be rejected, the difficulty for which some would have it cancelled, Dr Macknight observes, remains still: be-

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cause the seventh verse implies that cures were performed in this pool, and that only one at a time was cured, and consequently that these cures were miraculous. If so, it is as easy to conceive that an angel moved the water, and gave it its healing quality, as to fancy those cures were performed miraculously any other way. Grotius thinks, that the angel is said to have descended, not because he was ever seen to do so, but because the Jews were persuaded that God brought such things to pass by the ministrations of angels; so that from that violent motion of the water, and the cure following it, the presence of an angel was with reason supposed. Dr Hammond supposes, that the waters became medicinal by being impregnated with a healing warmth from the blood and entrails of the sacrificed beasts that were washed there; and that the *ἄγγελος*, angel, or messenger, in the text is not to be understood of those celestial beings that are usually distinguished by that name, but only of a common messenger, viz. an officer or servant of the priest, who at a proper season was sent by him to stir the pool.

BETHLEHEM, a town of Palestine, famous for the birth of Jesus Christ. It was once a flourishing town, but is now only a poor village. It is situated two leagues south-east of Jerusalem, on an eminence, in a country full of hills and valleys, and might be rendered very agreeable. The soil is the best in all those districts: fruits, vines, olives, and sesamum succeed here extremely well; but cultivation is wanting. They reckon about 600 men in this village capable of bearing arms upon occasion; and this often occurs, sometimes to resist the Pacha, sometimes to make war with the adjoining villages, and sometimes in consequence of intestine dissensions. Of these 600 men, about 100 are Latin Christians, who have a vicar dependent on the great convent of Jerusalem. Formerly their whole trade consisted in the manufacture of beads; but the reverend fathers not being able to find a sale for all they could furnish, they have resumed the cultivation of their lands. They make a white wine, which justifies the former celebrity of the wines of Judea, but it has the bad property of being very heady. The necessity of uniting for their common defence prevails over their religious differences, and makes the Christians live here in tolerable harmony with the Mahometans, their fellow-citizens. Both are of the party *Tamani*, which, in opposition to that called *Kaifi*, divides all Palestine into two factions, perpetually at variance. The courage of these peasants, which has been frequently tried, has rendered them formidable through all that country. Here is a church built by St Helena, in the form of a cross, which is very large; and from its top may be seen all the country round about. The roof is lofty, flat, and composed of cedar on the inside, and leaded without. Both sides of the nave are supported by two rows of marble pillars, each made of one piece, and eleven in a row, inasmuch that they make as it were five naves, separated from each other by these rows of pillars, in each of which is the picture of some saint. On the wall over the pillars there is a very beautiful Mosaic work, on a gold ground. The walls were formerly overlaid with fine marble, but the Turks have taken it to adorn their mosques. The three upper ends of the cross terminate in three semicircles, having in each an altar. Over the chan-

C c

cel

Bethesda
||
Bethlehem.

Bethlehem
||
Beth-peor.

cel there is a stately cupola, covered with lead on the outside, and within adorned with Mosaic work. Close to the church is the monastery of the Franciscans; which is large, but indifferently built. The gardens are defended with strong walls, and at the north-west of them stands a tower now almost in ruins. Their chapel is better taken care of. Through this there is a passage to a square cave, where they say the Innocents were buried. Beyond this there are passages to the tombs of St Jerom, St Paula, Eustochium, and Eusebius of Cremona. Beyond these there is a grot or cell, which they say was the lodging-place of St Jerom when he translated the Bible. Another entrance leads to a vault or chapel, 12 feet wide and 40 long, whose floor is paved, and sides lined with white marble, and the roof is adorned with Mosaic work, now much decayed. At the end of this there is an arched concavity, with an altar, over which is a picture of the nativity, and under it a vault, the middle of which is a star made with stones of various colours, to mark the place where they say our Saviour was born; and near this is the manger where they pretend he was laid; it is hewn out of a rock, and is now flagged with white marble.

BETHLEHEM, a town of the Netherlands, in the province of Brabant, subject to the house of Austria. E. Long. 4. 40. N. Lat. 51. 2.

BETHLEHEMITES, or BETHLEMITES, in Church History, a sort of monks introduced into England in the year 1257, habited like the Dominicans, except that, on their breast, they wore a star with five rays, in memory of the star or comet which appeared over Bethlehem at the nativity of our Saviour. They were celled at Cambridge, and had only one house in England.

There is also an order of Bethlehemites still subsisting in Peru, who have convents at Lima; one called of the incurables, the other of our Lady of mount Carmel. These Bethlehemites came originally from the city of Guatemala in Mexico, where they were instituted by the venerable Peter Joseph of Betaneur, for the service of the poor. Innocent XI. in 1687, approved the institute. They have already nine convents in Peru.

The Bethlehemites, though outwardly of great simplicity, pass for the most refined politicians; inasmuch as to be called the quintessence of the Carmelites and Jesuits. They are all fryars. For their almoner they choose a secular priest, whom they hire, and who has no vote in the chapter.

BETHORON, (anc. geog.), a town of Samaria; Upper and Nether, and both in the tribe of Ephraim, built by Shera grand daughter of Ephraim, 1 Chron. viii. 24. both which were restored by Solomon, after fallen to decay, 1 Kings ix. 17. and 2 Chron. viii. 5. Their distance was almost the whole breadth of the tribe of Ephraim, the Upper being in the north, the Nether in the south, of that tribe, Joshua xvi. We know more of the Nether than of the Upper: it was situate on a mountain, and therefore Josephus and Jerome mention going up or ascending; and it stood on the public road to Lydda and Cæsarea, distant an hundred stadia, or twelve miles from Jerusalem: and on account of this vicinity, some allot it to the tribe of Benjamin.

BETH-PEOR, (anc. geog.), a town of the Reu-

benites, on the other side Jordan, at mount Fogor, over against Jericho, six miles above Livias. It had a temple sacred to the idol Baal-Peor, Numbers xxv. 3. called Beel-Phegor by the Vulgate, interpreted Priapus by Jerome.

BETHPHAGE, (anc. geog.), a place at the west descent or declivity of mount Olivet, Matthew xxi. 1. From which it may be gathered, that the whole of that declivity, with a part of the valley, and the extreme skirts of the city, went under the common name of Bethphage.

BETHSAIDA. See BETHARAMPHTHA.

BETHSAN, or BETHSEAN, (anc. geog.), a town of Samaria, in the half tribe of Manasseh, on the borders of Galilee, about half a league from Jordan, on this side, having half of its territory in the Peraea: it was afterwards called *Scythopolis*: it was distant from Tiberias, situate on the lake Genesareth, 120 stadia, or 15 miles, to the south; and from Jerusalem to the north, 600 stadia, or 75 miles. As to the origin of the appellation *Scythopolis*, there scarce appears any thing in history that has a relation to it, but the irruption of the Scythians in the time of the Medes, when they over-ran all Asia. It was the greatest city of all the Decapolis, (Josephus.) It is called Bacton by Stephanus.

BETHUNE (Maximilian de), duke of Sully, grand master of the artillery, and marshal of France, sovereign prince of Enrichemont and Bois-Bell, marquis of Rosny, and one of the ablest and most upright ministers France ever had, was descended from an illustrious house, and was born in 1560. He entered very young into the service of Henry of Bourbon then king of Navarre, afterwards Henry IV. of France, who was just seven years his elder. He was bred in the reformed religion, and continued in the profession of it to the end of his life, though from political motives he advised his master to abjure it, as the only method of putting an end to the miseries of France. After Henry had gained possession of the kingdom, Sully performed all the duties of a great and good minister, while his master exercised all the offices of a great and good king. He had been at the battles of Coutras, Arques, and Ivry; at the sieges of Paris, Noyon, Rouen, and Laon; and signalized himself on every important occasion. In 1597 he was made chief overseer of the highways of France; and the following year was raised to the post of superintendant of the finances. Though he was then but 40 years of age, and had hitherto signalized himself only in the army, he put the king's finances in such order, that he paid his debts, which amounted to two hundred millions of livres, and laid up great sums in the king's treasury. In 1601 he was made grand-master of the artillery, the next year governor of the Bastile, and afterwards superintendant of the fortifications. He was then sent into England as ambassador extraordinary; and had, at his return, the government of Poictou. At last Henry IV. in 1606, erected in his favour the territory of Sully on the Loire into a duchy and peerage, and made him grand-master of the ports and havens. After the murder of that great prince in 1610, the duke of Sully, who had served him with the greatest zeal and fidelity, was obliged to retire to one of his houses, where he enjoyed a private life; but in 1634 he was made marshal of

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Bethune
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Betonica.

of France, upon which he resigned the post of grand-master of the artillery. He died in his castle of Villebon on the 21st of December 1641, at 82 years of age. His Memoirs are ranked among the best books of French history: they contain a most particular account of whatever passed from the peace of 1570 to the death of Henry IV. in 1610: and acquire additional value from the many curious personal anecdotes preserved in them. They were translated into English by Mrs Lennox in 1757.

BETHUNE, a town of France, in Artois, containing upwards of 5000 inhabitants. There is an entrance into this city through four gates, and it is surrounded with walls and fortified. The city and the castle taken together are of a triangular figure, but the castle itself is a very irregular building. The houses are very indifferent, and the streets ill paved; however, there is a large handsome square, and several churches. In the marshy lands near the city there are several canals cut for the conveniency of whitening linen. It is seated on a rock by the river Belfe. E. Long. 2. 48. N. Lat. 50. 32.

BETIS, governor of Gaza under Darius, famous for his valour and loyalty; he defended a place of consequence with a few men against Alexander, who was there shot through the shoulder. Betis thinking him slain, returned triumphantly to the city; but in a second assault he was wounded and brought to Alexander, who cruelly ordered him to be put to death.

BETLEY, a town of Staffordshire in England. It is seated on the confines of the county, next to Cheshire, in a barren sandy soil. W. Long. 2. 15. N. Lat. 53. 0.

BETLIS, a strong town of Armenia or Turcomania belonging to a bey or prince of the country, who is very powerful, and is subject to neither the grand signior nor king of Persia. It lies on the road from Tauris to Aleppo, and the prince can stop caravans whenever he pleases; for the passage between the mountains is so narrow, that ten men can defend it against 1000. The town is seated between two mountains about a cannon-shot from each other, and the castle is on an eminence exactly in the middle. This eminence is in the shape of a sugar-loaf; and is so steep on all sides, that it is impossible to get up but by winding round about it. The people in and about the town are shepherds, but are ready to take up arms at the command of their prince. E. Long. 42. 40. N. Lat. 37. 20.

BETON, a name given by the French engineers to a kind of mortar, which they use in raising the foundations of masonry under water. It consists of twelve parts of pozzolans or Dutch tarrafs, six of good sand, nine of unslaked lime, thirteen of stone splinters about the size of an egg, and three of tile-dust or cinders, or scales of iron out of a forge; this being well worked together, is left to stand for about 24 hours, or till it becomes so hard as not to be separated without a pick-axe.

BETONICA, BETONY: A genus of the gymnospermia order, belonging to the didynamia class of plants; and in the natural method ranking under the 42d order, *verticillata*. The calyx is awned; the upper lip of the corolla is ascending and flattish; and the tube is cylindric.

Species, &c. Of this genus botanical writers enu-

merate the following species. 1. The officinalis, purple or wood betony. 2. The danica, or greater Danish betony. 3. The alpina, or least Alpine betony. 4. The orientalis, or eastern betony, with very long narrow leaves, and a thicker spike of flowers. 5. The incana, or hoary Italian betony, with a flesh-coloured flower. Of these the first species only deserves notice. It is a low plant growing in woods and shady places in several parts both of England and Scotland; the flowers come forth in June and July, of a purplish colour, and stand in spikes on the top of the stalks. The leaves and flowers have an herbaceous, roughish, somewhat bitterish taste, accompanied with a very weak aromatic flavour. This herb has been long a favourite among writers on the materia medica, who have not failed to attribute to it abundance of good qualities. Experience, however, does not discover any other virtue in betony than that of a mild corroborant: as such, an infusion or light decoction of it may be drank as tea; or a saturated tincture in rectified spirits given in suitable doses, in laxity or debility of the viscera, and diseases proceeding from thence. The powder of the leaves snuffed up the nose provokes sneezing; and hence betony is sometimes made an ingredient in sternutatory powders: this effect does not seem to be owing, as is generally supposed, to any peculiar stimulating virtues in the herb, but to the rough hairs with which the leaves are covered. The roots of this plant differ greatly in their quality from the other parts: their taste is very bitter and nauseous; taken in a small dose, they vomit and purge violently, and are supposed to have somewhat in common with the roots of hellebore. According to Simon Paulli and Bartholinus, this plant affects those who gather any considerable quantity of it with a disorder resembling drunkenness. Its leaves are sometimes smoked like tobacco.

BETONICA Aquatica. See SCROPHULARIA.

BETONICA Pauli. See VERONICA.

BETONY. See BETONICA.

BETROTHMENT, a mutual promise or compact between two parties for a future marriage. The word imports as much as giving one's troth; that is, true faith, or promise. Betrothment amounts to the same with what is called by civilians and canonists *sponsalia*, or "espousals;" sometimes *desponsation*, and by the French *fiançailles*.

BETTERTON (Thomas), the celebrated actor, was the son of Mr Betterton under-cook to King Charles I. and was born in Tothil-street Westminster in the year 1635. Having received the first rudiments of a genteel education, his fondness for reading induced him to request of his parents that they would bind him an apprentice to a bookseller, which was readily complied with, fixing on one Mr Rhodes near Charing-cross for his master. This gentleman, who had been wardrobe-keeper to the theatre in Blackfriars before the troubles, obtained a licence in 1659, from the powers then in being, to set up a company of players in the Cock-pit in Drury-Lane, in which company Mr Betterton entered himself, and, though not much above 20 years of age, immediately gave proof of the most capital genius and merit.

Presently after the restoration, two distinct theatres were established by royal authority; the one in Drury-Lane in consequence of a patent granted to Henry Killigrew,

Betonia
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Betterton.

Betterton Killigrew, Esq; which was called the *King's Company*: the other in Lincoln's-Inn-Fields, who styled themselves the *Duke of York's Servants*, the patentee of which was the ingenious Sir William Davenant: which last mentioned gentleman having long had a close intimacy with and warm friendship for Mr Rhodes, engaged Mr Betterton, and all who had acted under Mr Rhodes, into his company; which opened in 1662 with a new play of Sir William's, in two parts, called the *Siege of Rhodes*. In this piece, as well as in the subsequent characters which Mr Betterton performed, he increased his reputation and esteem with the public, and indeed became so much in favour with King Charles II. that by his majesty's special command he went over to Paris to take a view of the French stage, that he might the better judge what would contribute to the improvement of our own; and it was upon this occasion, as is generally supposed, that moving scenes were first introduced upon the English theatre, which before had been only hung with tapestry.

In the year 1670 he married one Mrs Sanderfon, a female performer on the same stage; who, both as an actress and a woman, was every thing that human perfection was capable of arriving at, and with whom he through the whole course of his remaining life possessed every degree of happiness that a perfect union of hearts can bestow.

When the duke's company removed to Dorset-Gardens, he still continued with them; and on the coalition of the two companies in 1684, he acceded to the treaty, and remained among them; Mrs Betterton maintaining the same foremost figure among the women that her husband supported among the male performers. And so great was the estimation that they were both held in, that in the year 1675, when a pastoral called *Calisto*, or the *Chaste Nymph*, written by Mr Crown at the desire of Queen Catharine consort to Charles II. was to be performed at court by persons of the greatest distinction, our English Roscius was employed to instruct the gentlemen, and Mrs Betterton honoured with the tutorage of the ladies, among whom were the two princesses Mary and Anne, daughters of the Duke of York, both of whom succeeded to the crown of these realms. In grateful remembrance of which, the latter of them, when queen, settled a pension of L.100 *per annum* on her old instructress.

In 1693, Mr Betterton having founded the inclinations of a select number of the actors whom he found ready to join with him, obtained, through the influence of the Earl of Dorset, the royal licence for acting in a separate theatre; and was very soon enabled, by the voluntary subscriptions of many persons of quality, to erect a new playhouse within the walls of the Tennis-Court in Lincoln's-Inn-Fields. To this step Mr Betterton is said to have been induced, partly by ill treatment from the managers, and partly with a view to repair, by the more enlarged profits of a manager, the loss of his whole fortune (upwards of L.2000) which he had undergone in the year 1692, by adventuring it in a commercial scheme to the East-Indies. Be this, however, as it will, the new theatre opened in 1695 with Mr Congreve's *Love for Love*, the success of which was amazingly great. Yet in a few years it appeared that the profits arising from this theatre, opposed as it was by all the strength of Cibber's and Van-

brugh's writings at the other house, were very insignificant; and Mr Betterton growing now into the infirmities of age, and labouring under violent attacks of the gout, he gladly quitted at once the fatigues of management and the hurry of the stage.

The public, however, who retained a grateful sense of the pleasure they had frequently received from this theatrical veteran, and sensible of the narrowness of his circumstances, resolved to continue the marks of their esteem to him by giving him a benefit. On the 7th of April 1709 the comedy of *Love for Love* was performed for this purpose, in which this gentleman himself, though then upwards of 70 years of age, acted the youthful part of Valentine; as in the September following he did that of Hamlet, his performance of which the author of the *Tatler* has taken a particular notice of. On the former occasion, those very eminent performers, Mrs Barry, Mrs Bracegirdle, and Mr Dogget, who had all quitted the stage some years before, in gratitude to one whom they had had so many obligations to, acted the parts of Angelica, Mrs Frail, and Ben; and Mr Rowe wrote an epilogue for that night, which was spoken by the two ladies, supporting between them this once powerful supporter of the English stage. The profits of this night are said to have amounted to upwards of L.500, the prices having been raised to the same that the operas and oratorios are at present; and when the curtain drew up, almost as large an audience appearing behind as before it.

The next winter Mr Betterton was prevailed on by Mr Owen M'Swinney, then manager of the opera-house in the Hay-market (at which plays were acted four times a-week), to continue performing, though but seldom. In consequence of which, in the ensuing spring, viz. on the 25th of April 1710, another play was given out for this gentleman's benefit, viz. *The Maid's Tragedy* of Beaumont and Fletcher, in which he himself performed his celebrated part of Melanthus. This, however, was the last time of his appearing upon the stage. For having been suddenly seized with the gout, and being impatient at the thoughts of disappointing his friends, he made use of outward applications to reduce the swellings of his feet, which enabled him to walk on the stage, though obliged to have his foot in a slipper. But although he acted that day with unusual spirit and briskness, and met with universal applause, yet he paid very dear for this tribute he had paid to the public; for the fomentations he had made use of occasioning a revulsion of the gouty humour to the nobler parts, threw the distemper up into his head, and terminated his life on the 28th of that month. On the 2d of May his body was interred with much ceremony in the cloyster of Westminster, and great honour paid to his memory by his friend the *Tatler*, who has related in a very pathetic, and at the same time the most dignified manner, the process of the ceremonial. As an *author*, Mr Betterton had a considerable degree of merit. His dramatic works are, 1. *Amorous Widow*, a comedy. 2. *Dioclesian*, a dramatic opera. 3. *Masque in the Opera of the Prophets*. 4. *Revenge*, a comedy. 5. *Unjust Judge*, a tragedy. 6. *Woman made a Justice*, a comedy. As an *actor*, he was certainly one of the greatest of either his own or any other age; but those who are desirous of having him painted out in the most lively colours

Betue,
Betula

to their imagination, we must refer to the description given of him by his cotemporary and friend Colley Cibber, in the Apology for his own life.

BETUE, or BETAW, a territory of the Low Countries in the duchy of Guelderland, between the rivers Rhine and Leck. The ground is very moist, and the rains often render the roads impassable. It is divided into the Upper and Lower.

BETULA, the BIRCH-TREE: A genus of the tetrandria order, belonging to the monœcia class of plants; and in the natural method ranking under the 50th order, *Amentacea*. The calyx of the male is monophyllous, trifid, and triflorous; and the corolla is parted into four segments: The female calyx is monophyllous, trifid, and biflorous: The seeds have a membranaceous wing on both sides.

Species. 1. The alba, or common birch-tree, is so well known as to need no description. It is in general of a humble growth; however, in a soil and situation it affects, it will rise to a great height, and swell to a considerable size. There is a spruceness in its general appearance in summer; and in winter its bark sometimes exhibits, in its variegations of red and white, no inelegant object. Were it not for its being so commonly seen upon poor soils, and in bleak inhospitable situations, as well as for the mean and degrading purposes to which it is universally put, the birch would have some claim to being admitted to a place among the ornamentals. 2. The nana, or dwarf-birch, with roundish leaves, grows naturally in the northern parts of Europe and on the Alps. It seldom rises above two or three feet high, having slender branches garnished with round leaves, but seldom produces flowers here. It is preserved in some curious gardens for the sake of variety, but is a plant of no use. 3. The lenta, or Canada birch, grows to a timber-tree of 60 or more feet in height. The leaves are heart-shaped, oblong, smooth, of a thin consistence, pointed, and very sharply serrated. They differ in colour; and the varieties of this species go by the names of, 1. Dusky Canada birch; 2. White-paper birch; 3. Poplar-leaved Canada birch; 4. Low-growing Canada birch, &c.—4. The nigra, or black Virginian birch-tree, will grow to upwards of 60 feet in height. The branches are spotted, and more sparingly set in the trees than the common sorts. The leaves are broader, grow on long footstalks, and add a dignity to the appearance of the tree; and as it is naturally of upright and swift growth, and arrives at so great a magnitude, Hanbury thinks it ought to have a share among our forest-trees, and to be planted for standards in open places, as well as to be joined with other trees of its own growth in plantations more immediately designed for relaxation and pleasure. There are several varieties of this species, differing in the colour, size of the leaves, and shoots; all of which have names given them by nurserymen, who propagate the different sorts for sale; such as, 1. The broad-leaved Virginian birch; 2. The poplar-leaved birch; 3. The paper birch; 4. The brown birch, &c.—5. The alnus, or alder-tree, will grow to a large timber tree. Like the birch, it suffers, as an ornamental, from an association of ideas; we not only see it very common, but we see it in low, dreary, dirty situations: nevertheless, if the alder be suffered to form its own head in an open advantageous situation, it is by no means an un-

sightly tree: in Stow Gardens, in what is called the old part, there are some very fine ones: and in coming round from the house by the road leading to Buckingham, there is one which is truly ornamental. Hacked and disfigured in the manner in which alders in general are, they have but little effect in doing away the unsightliness of a swamp; but if they were suffered to rise in groups and singlets, open enough to have room to form their full tops, and close enough to hide sufficiently the unseemliness of the surface, even a moor or a morass seen from a distance might be rendered an agreeable object. Wherever the soil is, or can be made pasturable, the alder should by no means be permitted to gain a footing. Its suckers and seedlings poison the herbage; and it is a fact well known to the observant husbandman, that the roots of the alder have a peculiar property of rendering the soil they grow in more moist and rotten than it would be if not occupied by this aqueous plant. Plantations of alders should therefore be confined to swampy, low, unpasturable places; except when they are made for the purposes of ornament; and in this case the native species ought to give place to its more ornamental varieties, of which Hanbury makes five; namely, 1. The long-leaved alder; 2. The white alder; 3. The black alder; 4. The hoary-leaved alder; 5. The dwarf alder.

Culture. The first sort is easily propagated: it may be raised either from seeds or layering; and it will flourish in almost any soil and situation. The method of propagating the foreign sorts of birch is, 1. From seeds. We receive the seeds from America, where they are natives; and if we sow them in beds of fine mould, covering them over about a quarter of an inch deep, they will readily grow. During the time they are in the seminary, they must be constantly weeded, watered in dry weather, and when they are one or two years old, according to their strength, they should be planted in the nursery in rows in the usual manner. Weeding must always be observed in summer, and digging between the rows in winter; and when the plants are about a yard or four feet high, they will be of a good size to be planted out for the shrubbery-quarters. A part, therefore, may be then taken up for such purposes; whilst the remainder may be left to grow for standards, to answer such other purposes as may be wanted. 2. These trees may also be propagated by layers; and this is the way to continue the peculiarities in the varieties of the different sorts. A sufficient number of plants should be procured for this purpose, and set on a spot of double-dug ground, three yards distance from each other. The year following, if they have made no young shoots, they should be headed to within half a foot of the ground, to form the stools, which will then shoot vigorously the summer following; and in the autumn the young shoots should be plashed near the stools, and the tender twigs layered near their ends. They will then strike root, and become good plants by the autumn following; whilst fresh twigs will have sprung up from the stools, to be ready for the same operation. The layers, therefore, should be taken up, and the operation performed afresh. If the plants designed for stools have made good shoots the first year, they need not be headed down, but plashed near the ground, and all the young twigs layered. Thus may an immediate crop be raised this way; whilst

Berula

young

Betula.

young shoots will spring out in great plenty below the plashed part, in order for layering the succeeding year. This work, therefore, may be repeated every autumn or winter; when some of the strongest layers may be planted out, if they are immediately wanted; whilst the others may be removed into the nursery, to grow to be stronger plants, before they are removed to their destined habitations. 3. Cuttings also, if set in a moist shady border the beginning of October, will frequently grow: But as this is not a sure method, and as these trees are so easily propagated by layers, it hardly deserves to be put in practice.

The propagation of the alder, like that of the other aquatic natives, is very easy: it may be raised either from suckers, from cuttings, or by layering; and no doubt from seed, though this mode of propagation is seldom practised in this country. Evelyn mentions a peculiar method of raising this tree from cuttings or truncheons, which he calls the *Ferfey-manner*: he says, "I received it from a most ingenious gentleman of that country: it is, to take truncheons of two or three feet long at the beginning of the winter, and to bind them in faggots, and place the ends of them in water till towards the spring, by which season they will have contracted a swelling spire or knur about that part, which being set does (like the gennet-moil apple-tree, never fail of growing and striking root." Millar recommends truncheons of three feet long, two feet of which is to be thrust into the ground. Hanbury says that truncheons are uncertain, and strongly recommends layering; which, for preserving the varieties, as well as for ornamental plantations of alders in general, is the best method.

Uses. In some of the northern parts of Europe the wood of the white birch is much used for making carriages and wheels, being hard and of long duration. In France it is generally used for making wooden shoes, and in Britain for making womens shoe-heels, packing-boxes, brooms, hoops, &c. It also makes very good fuel, and is planted along with hazel to make charcoal for forges. The bark of the birch tree seems in a manner incorruptible. In Sweden the houses are covered with it, and it lasts many years. It frequently happens that the wood is entirely rotten, when the bark is perfectly sound and good. In Kamptschatka it is used for making drinking cups. It abounds with a resinous matter, to which its durability is certainly owing. In consequence of this matter, it is highly inflammable: and in the northern countries torches are made of this bark sliced and twisted together. The bark itself consists of two different substances; a thick brittle brownish red one; and several very thin, smooth, white, transparent membranes. In these last the inflammable property resides. The thick brittle part is less resinous, and has a roughish taste. It has been thought to possess some medical virtues, but concerning these experience has as yet determined nothing certain. Upon deeply wounding or boring the trunk of the tree in the beginning of spring, a sweetish juice issues forth, sometimes, as is said, in so large quantity as to equal the weight of the whole tree and root; one branch will bleed a gallon or more in a day. This juice is recommended in scorbutic disorders, and other foulnesses of the blood; its most sensible effect is to promote the urinary discharge. By proper fermentation with the addition of

sugar, this juice makes a pleasant wine. The bark of the Canada birch is very light, tough, and durable; and the inhabitants of America use it for canoes. Notwithstanding these uses to which the birch is applicable when already in possession, the planting of it is not recommended, except in bleak and barren situations where no other tree will thrive, and except as a screen and guardian to nurse up and defend from chilling blasts plants of greater value.

The alder tree flourishes best in low marshy situations, in which it is frequently planted to make hedges, and is also of great use for securing the banks of rivers. Grass grows well beneath its shade: the wood is soft and brittle; but lasts a long time under water, and consequently is of use for pipes, and to lay under the foundations of buildings situated upon bogs. Womens shoe-heels, ploughman's clogs, and various articles of the turner kind, are made of it. The bark gives a red colour, and with the addition of copperas a black: it is chiefly used by fishermen to stain their nets. In the Highlands of Scotland near Dundonnell, Mr Pen-nant says, the boughs cut in the summer, spread over the fields, and left to rot in the winter, are found to answer as a manure. In March, the ground is cleared of the undecayed parts, and then ploughed. The fresh gathered leaves are covered with a glutinous liquor; and some people strew them on their floors to kill fleas. These insects are said to be entangled in the glutinous liquor of the leaves, as birds are by birdlime. The whole plant is astringent, and its bark has been recommended in intermittent fevers. The bark of the black berry bearing alder is said to be the most certain purge for horned cattle in obstinate constipations of the bowels. Horses, cows, goats, and sheep, eat the leaves of all the species of betula; but swine refuse them. When eaten by cows, they are said greatly to increase the quantity of the milk.

BETULEIUS (Sixtus), an able grammarian, a good Latin poet and philosopher, born at Memmingen in the year 1500; his true name was *Birck*. He taught the belles letters and philosophy with reputation; and became principal of the college of Augsburg, where he died on the 16th of June 1554. He published several works in prose; and his dramatic pieces of Joseph, Susannah, and Judith, are esteemed.

BEVECUM, a town of the Austrian Netherlands, in the province of Brabant. E. Long. 4. 50. N. Lat. 50. 45.

BEVEL, among masons, carpenters, &c. a kind of square, one leg whereof is frequently crooked, according to the sweep of an arch or vault. It is moveable on a centre, and so may be set to any angle.

BEVEL Angle, any other angle besides those of 90 or 45 degrees.

BEVELAND (North and South), two islands in the province of Zealand, between the eastern and western branches of the river Scheld, making part of the United Provinces.

BEVELLING, in ship-building, the art of hewing a timber with a proper and regular curve, according to a mould which is laid on one side of its surface. "In order to hew any piece of timber to its proper bevel, it will be necessary, first, to make one side *fair* and *out of winding*; a term used to signify that the side of a timber should be a plane. If this side be uppermost,

Betula.

Bevelling.

Beverage permost, and placed horizontally, or upon a level, it is plain, if the timber is to be hewed square, it may be done by a plummet and line; but if the timber is not hewed square, the line will not touch both the upper and lower edge of the piece; or if a square be applied to it, there will be wood wanting either at the upper or lower side. This is called *within* or *without* a square. When the wood is deficient at the under side, it is called *under-bevelling*; and when it is deficient on the upper side, it is called *standing-bevelling*: and this deficiency will be more or less according to the depth of the piece; so that, before the proper bevellings of the timbers are found, it will be sometimes very convenient to assign the breadth of the timbers; nay, in most cases it will be absolutely necessary, especially afore and abaft: though the breadth of two timbers, or the timber and room, which includes the two timbers and the space between them, may be taken without any sensible error, as far as the square body goes. For as one line represents the moulding side of two timbers, the fore-side of the one being supposed to unite with the aft-side of the other; the two may be considered as one entire piece of timber." *Murray's Ship-building.*

BEVERAGE, in a general sense, signifies a *drink*: hence nectar is said to be the beverage of the gods. In writers of the middle age, beverage, *beveragium*, or *bi-beragium*, denotes money given to an artificer, or other person, to drink, over and above his hire or wages.

BEVERIDGE (William), a learned English bishop, in the beginning of the 18th century, was born in the year 1638, and educated in St John's college Cambridge, where he distinguished himself very early by his extensive learning, and particularly by his knowledge of the oriental languages. Upon the deprivation of Dr Thomas Ken, bishop of Bath and Wells, for not taking the oaths to the government in 1691, he refused the offer of that see, tho' he was then chaplain to King William and Queen Mary. In 1704 he was consecrated to the bishopric of St Asaph; in which high function he so behaved himself all along, and discharged it in so exemplary a manner, that he approved himself a truly primitive prelate. He died at his lodgings in the Cloisters in Westminster-abbey in 1707, aged 69. As his whole life was spent in acts of piety and charity, so he gave remarkable instances of both at his death, leaving the bulk of his estate for the propagation of the gospel, and promoting of Christian knowledge, at home as well as abroad. His *Private Thoughts upon a Christian Life* is a very popular, though in many points a very exceptionable, book. He wrote several other works on various subjects, particularly on the oriental tongues.

BEVERLAND (Hadrian), a man of excellent genius in the end of the 17th century, but who prostituted it in the study and composition of books of a very obnoxious kind. He was a perfect master of Ovid, Catullus, Petronius, and authors of that stamp. He is famous for his book on Original Sin, in which he maintained, that Adam's sin consisted in his commerce with his wife, and that original sin is nothing else but the inclination of the sexes to each other: it was condemned to be burnt. He led a scandalous life, but seems to have repented of his wicked manners and lewd writings; for he published a treatise in the end of his

life, *De Fornicatione Cavenda*, in 1698. It is said he died mad.

BEVERLEY, a town of Yorkshire, governed by a mayor, a recorder, 12 aldermen, &c. and sends two members to parliament. The minster here is a very fair and neat structure, and the roof is an arch of stone. In it are several monuments of the Percies, Earls of Northumberland, who had added a little chapel to the choir, in the windows whereof there are several pictures of that family painted on glass. At the upper end of the choir, at the right of the altar-place, stands the freed-stool, made of one entire stone, to which every one that fled had a right of protection. At the upper end of the body of the church, next the choir, hangs an ancient table, with the picture of king Athelstane, who founded the church. Between them is this inscription:

Als free make I thee,
As heart can wish, or egh can see.

Hence the inhabitants pay no toll in any town or port in England. In the body of the church stands an ancient monument, called the *Virgins Tomb*, because two virgin-sisters lie buried there, who gave the town a piece of land, into which any free man may put three milk cows from Lady-day to Michaelmas. At the lower end of the body of the church is a large font of agate stone.

Near the minster, on the south side of it, is a place called *Hall-Garth*, wherein they keep a court of record, called *Provost's Court*. In this causes arising within the liberties may be tried for any sum. The liberties contain above 100 towns and parts of towns, in Holderness and other parts of the east-riding belonging to it. The town is a mile in length, having pleasant springs running quite through it. It is beautified with two stately churches; and has a free-school, with two fellowships, six scholarships, and three exhibitions in St John's college, Cambridge, belonging to it; besides six alms-houses, where none are admitted but those that give bond to leave their effects to the poor when they die. The principal trade of this town is making malt, oat-meal, and tanned leather; and the poor people chiefly support themselves by making bone-lace. About a mile east from the town, there is a mineral water, which cures eruptions of the skin, and is beneficial in the king's evil. E. Long. 0. 9. N. Lat. 53. 50.

BEVERLY (John of), in Latin *Joannes Beverlaci*, archbishop of York in the eighth century, was born of a noble family at Harpham in Northumberland, and was justly esteemed one of the best scholars of his time. He was first a monk, and afterwards abbot of the monastery of St Hilda, when his merit recommended him to the favour of Alfred king of Northumberland, who in the year 685 advanced him to the see of Hagustald or Hexham, and in 687 translated him to the archbishopric of York. This prelate was tutor to the famous Bede; and lived in the strictest friendship with Acca and other Anglo-Saxon doctors, several of whom he engaged to write comments on the Holy Scriptures. In 704, he founded a college at Beverly for secular priests; and after he had governed the see of York 34 years, being tired of the tumults

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tumults and confusions that prevailed in the church, divested himself of his episcopal character, and retired to Beverly; where he died four years after, on the 7th of May 721.—Bede and other monkish writers ascribe several miracles to him. Between 300 and 400 years after his death, his body was taken up by Alfric archbishopric of York, and placed in a shrine richly adorned with silver, gold, and precious stones; and in 1416, the day of his death was, by a synod held at London, appointed a festival. We are told that William the Conqueror, when he ravaged Northumberland with a numerous army, spared Beverly alone, out of a religious veneration for St John of that place. This prelate wrote some pieces which are mentioned by Bale and Pits, viz. 1. *Pro Luca exponenda.* 2. *Homilia in Evangelica.* 3. *Epistola ad Hildam Abbatisam.* 4. *Epistola ad Herebaldum, Andenum, et Bertinum.*

BEVERUNGEN, a town of Germany, in the diocese of Paderborn, seated at the confluence of the rivers Beve and Weser, in E. Long. 9. 30. N. Lat. 51. 40.

BEVILE, in heraldry, a thing broken or opening like a carpenter's rule: Thus we say, he beareth argent, a chief bevile, vert, by the name of *beverlis*.

BEVIN (Elway), a musician eminently skilled in the knowledge of practical composition, flourished towards the end of Queen Elizabeth's reign. He was of Welch extraction, and had been educated under Tallis, upon whose recommendation it was that in 1589 he was sworn in gentleman extraordinary of the chapel; from whence he was expelled in 1637, it being discovered that he adhered to the Romish communion. He was also organist of Bristol cathedral, but forfeited that employment at the same time with his place in the chapel. Child, afterwards Doctor, was his scholar. He has composed sundry services, and a few anthems. Before Bevin's time the precepts for the composition of canon were known to few. Tallis, Bird, Waterhouse, and Farmer, were eminently skilled in this most abstruse part of musical practice. Every canon, as given to the public, was a kind of enigma. Compositions of this kind were sometimes exhibited in the form of a cross, sometimes in that of a circle; there is now extant one resembling a horizontal sun-dial: and the *resolution* (as it was called) of a canon, which was the resolving it into its elements and reducing it into score, was deemed a work of almost as great difficulty as the original composition. But Bevin, with a view to the improvement of students, generously communicated the result of many years study and experience in a treatise which is highly commended by all who have taken occasion to speak of it. This book was published in 4to 1631, and dedicated to Goodman bishop of Gloucester, with the following title: 'A briefe and short instruction of the art of musicke, to teach how to make discant of all proportions that are in use: very necessary for all such as are desirous to attain to knowledge in the art; and may by practice, if they can sing, soone be able to compose, three, four, and five parts, and also to compose all sorts of canons that are usuall, by these directions of two or three parts in one upon the plain song.' The rules contained in this book for composition in general are very brief; but for the composition of canon there are in it a great variety of examples of almost all the possible forms in which it is

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capable of being constructed, even to the extent of 60 parts.

BEWDLY, a town of Worcestershire in England, seated on the bank of the river Severn, in W. Long. 2. 20. N. Lat. 52. 25. It has its name *Bewdley*, *Beawley*, or *Beaulieu*, from its pleasant situation on the declivity of a hill overlooking the river, and commanding a fine prospect of the country, and formerly of the forest of Wyre, remarkable for its tall stately oaks and other trees, which have since been either blown or cut down. It was formerly accounted so delightful a place, that Henry VII. built a house here for prince Arthur, which he called *Tiken-hall*. Bewdley sent burgesses to parliament very early, and had charters and great privileges from Edward IV. and Henry VII. which were confirmed, with the addition of others, by Henry VIII. in whose time it was annexed to the county of Worcester. King James I. granted it a charter; of which a surrender was procured in Charles II.'s time, and the corporation was new-modelled. King James II. compelled it to accept of a new charter; but the former surrender, upon a trial, was held void, and a new charter was obtained of Queen Anne. In consequence of this it is governed by a bailiff and burgesses, recorder, steward, town-clerk, &c. The town is neat and well built; and carries on a considerable trade, by means of the Severn, in salt, glass, iron-ware, and Manchester goods; but its chief manufacture is in caps, commonly called *Monmouth Caps*. It has a good market for corn, malt, leather, and hops.

BEWITS, in falconry, pieces of leather, to which a hawk's bells are fastened, and buttoned to his legs.

BEY, among the Turks, signifies a governor of a country or town. The Turks write it *begh*, or *bek*, but pronounce it *bey*.

This word is particularly applied to a lord of a banner, whom, in the same language, they call *sangiac beg* or *bey*. Every province in Turkey is divided into seven sangiacs, or banners, each of which qualifies a bey; and these are all commanded by the governor of the province, whom they also call *begler-beg*, that is, lord of all the beghs or beys of the province: these beys are much the same as bannerets were formerly in England.

BEY of Tunis, denotes a prince or king thereof; answering to what at Algiers is called the *dey*. In the kingdom of Algiers, each province is governed by a bey, or vice-roy, who is appointed and removed at pleasure by the dey; but has a despotic power within his jurisdiction; and at the season for collecting the tribute from the Arabs, is assisted by a body of troops from Algiers.

BEYS (Giles), a celebrated printer at Paris, in the 16th century, and the first introducer of the consonants j and v.

BEZA (Theodore), one of the principal pillars of the reformed church, was born at Vezelai, in Burgundy, June 24th, 1519. He was brought up by his uncle Nicholas de Beza, counsellor of the parliament of Paris, till the month of December 1528, when he sent him to study at Orleans, and afterwards at Bourges, where he was under the care of Melchior Wolmar, under whom he made an extraordinary progress in polite learning, and from him imbibed the principles of Calvinism. His uncle intended him for the

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Beza. the bar; but the law not suiting his disposition, he spent most of his time in reading the Greek and Latin authors, and in composing verses. In 1539, he took up his licentiate's degree, and went to Paris. He fell into snares in his youth, and wrote some licentious things. Sickness awakened him; and he pursued a vow he had formerly made, of entering into the reformed religion. According to this resolution he went to Geneva and made public profession of the reformed religion. In 1549, he accepted of the Greek professorship at Lausanne, where he also read lectures in French on the New Testament to the refugees of both sexes who dwelt in that city. Having settled at Geneva, he adhered to Calvin in the strictest manner, and became in a little time his colleague in the church and in the university. He was sent to Nerac, at the solicitation of some great men of the kingdom, to convert the king of Navarre, and to confer with him upon affairs of importance. This was when the Guises had got the authority under the reign of Francis II. to the prejudice of the princes of the blood. The king of Navarre having testified, both by letters and deputies, that he desired that Beza might assist at the conference of Poissy, the senate of Geneva consented. The assembly hearkened attentively to his harangue, till, speaking of the real presence, he said, that the body of Jesus Christ was as distant from the bread and wine, as the highest heaven is from the earth. This made a murmur: some cried out, *Blasphemavit!* others got up to go away. Cardinal de Tournon, who sat in the first place, desired the king and queen either to silence Beza, or to permit him and his company to withdraw. The king did not stir, nor any of the princes, and leave was given to go on. Throughout the whole conference he behaved himself with great ability. He often preached before the queen of Navarre, the prince of Condé, and in the suburbs of Paris. After the massacre of Vassy, he was deputed to the king to complain of this violence. The civil war followed soon after, during which the prince of Condé kept him with him; and while the prince was imprisoned, he lived with Admiral de Coligni, and did not return to Geneva till after the peace 1563. In 1571, he was chosen moderator at the national synod of Rochelle; and the year after, assisted at that of Nîmes; after this, he assisted at the conferences of Montheliard, and at those of Bern. The infirmities of old age beginning to fall heavy upon him in 1597, he could seldom speak in public: and at last he left it off entirely in the beginning of the year 1600. However, in 1597, he wrote some animated verses against the Jesuits, on occasion of the report that was made of his death, and of his having before he died made profession of the Roman faith. He lived till the 13th of October 1605. He was a man of extraordinary merit, and one who did great services to the Protestant cause. This, however, exposed him to innumerable slanders and calumnies; but he showed both to the Catholics and Lutherans, that he understood how to defend himself. He wrote, 1. A Translation of the New Testament; 2. Turned the Psalms into Latin verse; 3. Published a Treatise on the Sacraments; 4. Some Sermons on the Passion of Jesus Christ and on Solomon's Song; 5. A Version of the Canticles, in lyric verse; 6. A

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French tragi-comedy, intitled, The Sacrifice of Abraham; and many other pieces.

BEZANS, cotton cloths, which come from Bengal; some are white, and others striped with several colours.

BEZANTLER, the branch of a deer's horns next below the brow-antler.

BEZOAR, in natural history and medicine, a general name for certain animal-substances supposed to be effectual in preventing the fatal consequences of poison. The word comes from the Persian *badzcher*, *bazcher*, or *pahazar*, which signifies an antidote.

The first mention made of bezoar is in Avenzoar, an Arabian physician, who gives a very romantic account of its origin. He describes it as generated of the tears or gum of the eyes of stags; who, after eating serpents, used to run into the water up to the nose, where they stood till their eyes began to ooze a humour, which, collecting under the eye-lids, gradually thickened and coagulated, till, being grown hard, it was thrown off by the animal in rubbing frequently. Other opinions no less fabulous obtained till the time of Garcias al Horto, physician to the Portuguese viceroy of the Indies, who gave the first genuine account of it. Kempfer afterwards gave a description of it, with some new particulars.

The bezoar is a calculous concretion found in the stomach of certain animals of the goat kind. See **CAPRA**. It is composed of concentric coats surrounding one another, with a little cavity in the middle, containing a bit of wood, straw, hair, or the like substances.

There are two sorts of bezoar; one brought from Persia and the East-Indies, the other from the Spanish West-Indies. The first or best sort, called *oriental bezoar*, is of a shining dark-green or olive colour, and an even smooth surface; on removing the outward coat, that which lies underneath it appears likewise smooth and shining. The *occidental* has a rough surface, and less of a green colour than the foregoing; it is likewise much heavier, more brittle, and of a looser texture; the coats are thicker, and on breaking exhibit a number of striæ curiously interwoven. The oriental is generally less than a walnut; the occidental for the most part larger, and sometimes as big as a goose egg. The first is universally most esteemed, and is the only sort now retained by the London college: the Edinburgh, in the edition of their pharmacopœia preceding the present, directed both; but they now seem to allow them to be used promiscuously, retaining in their catalogue only the name *bezoar lapis*.

This stone is in high esteem among the Persians, and even of greater value than in Europe; which, with sundry other circumstances needless to relate here, has given occasion to many to suspect, that the true bezoar is never brought to us. Some authors relate with great confidence, that all the stones commonly sold under this name are artificial compositions. That some of them are so, is evident; hence the great differences in the accounts which different persons have given of their qualities: the stones examined by Slare as oriental bezoar did not dissolve in acids; those which Grew and Boyle made trial of, did; those employed by Geoffroy (in some experiments related in the French memoirs

Bezoar. 1710) did not seem to be acted on by rectified spirits; whilst some of those examined by Neumann at Berlin almost totally dissolved therein. The common mark of the goodness of this stone, is its striking a deep green colour on white paper that has been rubbed with chalk.

Bezoar was not known to the ancient Greeks, and is first taken notice of by the Arabians (as above mentioned), who extol it in a great variety of disorders, particularly against poisons. Later writers also bestow extraordinary commendations on it as a sudorific and alexipharmac; virtues to which it certainly has no pretence. It has no smell or taste, is not digestible in the stomach of the animal in which it is found, and is scarce capable of being acted on by any of the juices of the human body. It cannot be considered in any other light than as an absorbent; and is much the weakest of all the common substances of that class. It has been given to half a dram, and sometimes a whole dram, without any sensible effect; though the general dose (on account of its great price) is only a few grains.

BEZOAR, in a more extensive sense, includes all substances formed stratum super stratum in the stomachs or intestines of animals; in which sense pearls, the concretions called *crabs-eyes*, &c. belong to the class of bezoars. To this also belong the hippolithus, or *bezoar equinum*, a stone sometimes found in the stomach or intestines of a horse; the monkey-bezoar, a stone said to be found in the stomachs of certain monkeys in Brazil and the East-Indies, harder than the oriental bezoar, of a dark-green colour, and very costly on account of its scarcity.—*Bezoar bovinum*, is a yellowish stone found in the ox's gall-bladder.—*Human bezoars* are stony substances found in the intestines of several persons, formed from the stones of plums, or other fruits, retained in the cæcum or other guts, and growing coated over, of which we have an instance given by Dr Cole, Phil. Trans. n° 235.—*Bezoar microscopium* is the same with the human calculus; and is various in its degrees of hardness, as well as in its size and figure. It has been used in the place of the more costly sorts.—As to the *bezoar hystricis*, a concretion found in the gall-bladder of an Indian porcupine; and the German bezoar, or that found in mountain-deer, especially on the Alps; these, not being stones, are more properly called by late writers *agagropile*; the former consisting of woolly fibres, and a bitter friable matter, having neither laminæ nor membranes; the latter being a ball of hair or herbs, or perhaps roots, compacted in the stomach of the animal.—They are all, as medicines, unworthy of regard.—The bezoar bovinum, or ox-bezoar, is used by miniature-painters in several casts of yellow.

BEZOAR mineral. See PHARMACY-Index.

Fossil BEZOAR, is a kind of figured stone, formed, like the animal bezoar, of several coats or strata ranged round some extraneous body which forms a nucleus, and supposed to have the same virtues. It is found chiefly in Sicily, in sand and clay pits. It is of a purple colour, with a rough surface, the size of a walnut, and light. When broken, it is found to be an iron crust, containing in its hollow a fine greenish white earth, resembling pale bezoar. The earth is used, and

not the shells. It seems to be of the nature of bole armeniac. It is called *Sicilian earth*.

BEZOARDIC, an appellation given to whatever partakes of the nature of bezoar; also to compound medicines whereof bezoar makes an ingredient.

BIA, in commerce, a name given by the Siamese to those small shells which are called *cowries* throughout almost all the other parts of the East-Indies. See **COWRIES**.

BIÆUM, *βίαιον*, in rhetoric, denotes a kind of counter-argument, whereby something alleged for the adversary is retorted against him, and made to conclude a different way: for instance, *Occidisti, quia adlitisti interfecto.*—*βίαιον*, *Immo quia adlitisti interfecto, non occidi; nam si id esset, in fugam me conjecissem.* “You killed the person, because you were found standing by his body. *Biæum*, Rather I did not kill him because I was found standing by his body; since, in the other case, I should have fled away.”

BIÆUM, in the Grecian laws, was an action brought against those who ravished women, or used violence to any man's person.

BIAFAR, or **BIAFRA**, a kingdom of Africa, situated to the east of Benin, to the west of Medra, from which it is divided by a chain of mountains, and extending southward to the fourth degree of north latitude. The natives are the most of all negroes addicted to, and infatuated with, magic; imagining themselves capable of causing rain, thunder, and lightning: therefore they worship the devil with great zeal, and even sacrifice their children to him.

BIAFORA, in the customs of the middle age, a form of cry or alarm to arms; on the hearing whereof, the inhabitants of towns or villages were to issue forth, and attend their prince. The word seems originally from Gascony; and the Italians even now on a sudden insurrection of the people, commonly cry, *Via-fora*, by an usual change of the letter B into V.

BIARCHUS, an officer in the court, of the emperors of Constantinople, intrusted with the care and inspection of the provisions of the soldiery.

BIALOGOROD, or **AKERMAN**, a strong town of Bessarabia, in European Turkey. It is seated on a lake called *Vidono*, near the sea-side, in E. Long. 22. 50. N. Lat. 46. 24.

BIANA, a town of Asia in the dominions of the Great Mogul, remarkable for its excellent indigo. E. Long. 77. 0. N. Lat. 26. 20.

BIANCHI (Francesco), called *Il Frari*, an eminent painter, was born at Modena; and had the honour of being master to one of the most esteemed painters that ever appeared, Antonio Correggio. His colouring was delicately fine; his attitudes full of grace; and his invention extremely grand. His works had an astonishing beauty, and are prized as highly as even those of Correggio. He died in 1520.

BIANCHINI (Francis), one of the most learned men of his time, was born at Verona in 1662, of a noble and ancient family. His taste for natural philosophy and mathematics induced him to establish the academy of Aletofili, at Verona. He went to Rome in 1684; and was made librarian to Cardinal Ottoboni, who was afterwards pope under the name of Alexander VIII. He also became canon of St Mary de la Rotonda, and

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at length of St Lawrence in Damaſo. He was eſteemed by the learned; and was a member of many academies. He published ſeveral ingenious diſſertations, &c. and died in 1729, aged 67.

BIAS, one of the ſeven ſages of Greece, flouriſhed about 608 before Chriſt. He was accuſtomed to ſay, "It was a ſickneſs of the mind to wiſh for impoſſible things." During the ſiege of Priena, his native city, being aſked why he was the only one who retired from the place without carrying any thing with him, he replied, That he carried his all with him; meaning, that his knowledge and virtue were the only bleſſings that were peculiarly his own, ſince they could not be taken from him. He expired while pleading for one of his friends.

BIAS, or *Biaſs*, in a general ſenſe, the inclination or bent of a perſon's mind to one thing more than another.—It alſo ſignifies the lead or weight put into a bowel, that draws or turns the courſe of it any way to which the bias looks.

BIBERACH, a free and imperial city of Suabia in Germany. It has a large manufacture in ſuſtians, and is ſeated in a pleaſant fertile valley on the river Ruſs. E. Long. 10. 2. N. Lat. 48. 4.

BIBERSBERG, a town of Upper Hungary, ſituated in E. Long. 17. 25. N. Lat. 48. 35.

BIBIENA (Ferdinand Galli), an excellent painter and architect, was born at Bologna in 1657; and was ſurnamed *Bibiena* from a territory of that name in Tuſcany, in which his father was born. He acquired ſuch reputation by his ſkill in architecture, the decorations of the theatre and perſpective, that the duke of Parma invited him to his court, and made him his firſt painter and architect. Bibiena at length went to the emperor's court, where he had the ſame honours and advantages. He wrote two books of architecture; and died at Bologna, at above 80 years of age. His ſons followed with ſucceſs the ſame profeſſions.

BIBLE (in Greek βιβλα, *the book*), a name applied by Chriſtians by way of eminence or diſtinction to the collection of ſacred writings, or the holy ſcriptures of the Old and New Testaments; known alſo by various other appellations, as, the Sacred Books, Holy Writ, Inſpired Writings, Scriptures, &c. The Jews ſtyled the Bible (that is, the Old Teſtament) *mikra*; which ſignifies *Leſſon* or *Lecture*.

This collection of the ſacred writings containing thoſe of the Old and New Teſtament, is juſtly looked upon as the foundation of the Jewiſh as well as the Chriſtian religion. The Jews, it is true, acknowledged only the ſcriptures of the Old Teſtament, the correcting and publiſhing of which is unanimouſly aſcribed, both by the Jews and Chriſtians, to Ezra. Some of the ancient fathers, on no other foundation than that fabulous and apocryphal book, the ſecond book of Eſdras, pretend, that the ſcriptures were entirely loſt and deſtroyed at the Babyloniſh captivity, and that Ezra reſtored them all again by divine revelation. What is certain is, that in the reign of Joſiah there was no other book of the law extant beſides that found in the temple by Hilkiah; from which original, by order of that pious king, copies were immediately written out, and ſearch made for all the other parts of the ſcriptures, (2 Kings xxii.); by which means copies of the whole became multiplied among the people, who carried them with them into their captivity. Af-

Bible.

ter the return of the Jews from the Babyloniſh captivity, Ezra got together as many copies as he could of the Sacred writings, and out of them all prepared a correct edition, diſpoſing the ſeveral books in their proper order, and ſettling the canon of ſcripture for his time. Theſe books he divided into three parts. 1. The Law. 2. The Prophets. 3. The Cetubim or Hagiographia, i. e. *The Holy Writings*.

I. The Law contains. 1. Genesis. 2. Exodus. 3. Leviticus. 4. Numbers. 5. Deuteronomy.

II. The writings of the prophets are, 1. Joſhua. 2. Judges, with Ruth. 3. Samuel. 4. Kings. 5. Iſaiah. 6. Jeremiah, with his Lamentations. 7. Ezekiel. 8. Daniel. 9. The twelve minor prophets. 10. Job. 11. Ezra. 12. Nehemiah. 13. Eſther.

III. And the Hagiographia conſiſts of, 1. The Pſalms. 2. The Proverbs. 3. Eccleſiaſtes. 4. The Song of Solomon. This diviſion was made for the ſake of reducing the number of the ſacred books to the number of the letters in their alphabet, which amount to 22. At preſent, the Jews reckon 24 books in their canon of ſcripture, in diſpoſing of which the law ſtands as it did in the former diviſion, and the prophets are diſtributed into the former and latter prophets.

The former prophets are,

Joſhua, Judges, Samuel, Kings.

The latter prophets are,

Iſaiah, Jeremiah, Ezekiel, and the 12 minor prophets.

And the hagiographia conſiſts of

The Pſalms, the Proverbs, Job, the Song of Solomon, Ruth, the Lamentations, Eccleſiaſtes, Eſther, Daniel, Ezra, the Chronicles.

Under the name of Ezra, they comprehend Nehemiah. It is true this order hath not always been obſerved, but the variations from it are of little or no moment.

The five books of the law are divided into 54 ſections. This diviſion many of the Jews hold to have been appointed by Moſes himſelf; but others, with more probability, aſcribe it to Ezra. The deſign of this diviſion was, that one of theſe ſections might be read in their ſynagogues every ſabbath-day. The number was 54, becauſe in their intercalated years a month being then added, there were 54 ſabbaths. In other years, they reduced them to 52, by twice joining together two ſhort ſections. Till the perſecution of Antiochus Epiphanes, they read only the law; but the reading of it being then prohibited, they ſubſtituted in the room of it 54 ſections out of the prophets; and when the reading of the law was reſtored by the Maccabees, the ſection which was read every ſabbath out of the law ſerved for their firſt leſſon, and the ſection out of the prophets for their ſecond. Theſe ſections were divided into verſes; of which diviſion, if Ezra was not the author, it was introduced not long after him, and ſeems to have been deſigned for the uſe of the Targumiſts or Chaldee interpreters: for after the return of the Jews from the Babyloniſh captivity, when the Hebrew language ceaſed to be their mother tongue, and the Chaldee grew into uſe inſtead of it, the cuſtom was that the law ſhould be firſt read in the original Hebrew, and then interpreted to the people in the Chaldee language, for which purpoſe theſe ſhorter ſections or periods were very convenient.

The diviſion of the ſcriptures into chapters, as we at preſent have them, is of much later date. Some attri-

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bute it to Stephen Langton, archbishop of Canterbury, in the reigns of John and Henry III. But the true author of the invention was Hugo de Sancto Caro, commonly called *Hugo Cardinalis*, because he was the first Dominican that ever was raised to the degree of cardinal. This Hugo flourished about the year 1240. He wrote a comment on the scriptures, and projected the first concordance, which is that of the vulgar Latin Bible. The aim of this work being for the more easy finding out any word or passage in the scriptures, he found it necessary to divide the book into sections, and the sections into subdivisions; for till that time the vulgar Latin Bibles were without any division at all. These sections are the chapters into which the Bible hath ever since been divided. But the subdivision of the chapters was not then into verses, as it is now. Hugo's method of subdividing them was by the letters A, B, C, D, E, F, G, placed in the margin at an equal distance from each other, according to the length of the chapters. The subdivision of the chapters into verses, as they now stand in our Bibles, had its original from a famous Jewish rabbi, named Mordecai Nathan, about the year 1445. This rabbi, in imitation of Hugo Cardinalis, drew up a concordance to the Hebrew Bible, for the use of the Jews. But though he followed Hugo in his division of the books into chapters, he refined upon his invention as to the subdivision, and contrived that by verses: this being found to be a much more convenient method, it has been ever since followed. And thus, as the Jews borrowed the division of the books of the holy scriptures into chapters from the Christians, in like manner the Christians borrowed that of the chapters into verses from the Jews.

The order and division of the books of the Bible, as well as of the Old as the New Testament, according to the disposition made by the council of Trent, by decree I. session iv. are as follow: where we are to observe, that those books to which the asterisks are prefixed, are rejected by the Protestants as apocryphal.

Genesis,
Exodus,
Leviticus,
Numbers,
Deuteronomy,
Joshua,
Judges and Ruth,
1 Samuel, or 1 Kings,
2 Samuel, or 2 Kings,
1 Kings, otherwise called 3 Kings,
2 Kings, otherwise called 4 Kings,
1 Chronicles,
2 Chronicles,
1 Esdras (as the LXX and Vulgate call it), or the book of Ezra,
2 Esdras or (as we have it) the book of Nehemiah,
* Tobit,
* Judith,
Esther,
Job,
Psalms,
Proverbs,
Ecclesiastes,
Song of Solomon,
* The book of Wisdom,

* Ecclesiasticus,

Isaiah,

Jeremiah and * Baruch,

Ezekiel,

Daniel,

Hosea,

Joel,

Amos,

Obadiah,

Nahum, which we place immediately after Micah, before Habakkuk.

Jonah, which we place immediately after Obadiah.

Micah,

Habakkuk,

Zephaniah,

Haggai,

Zechariah,

Malachi,

* 1 Maccabees,

* 2 Maccabees.

The books of the New Testament are,

The Gospel of {
St Matthew,
St Mark,
St Luke,
St John,

The Acts of the Apostles.

The Epistle of St Paul to {
the Romans,
the Corinthians, I.
the Corinthians, II.
the Galatians,
the Ephesians,
the Philippians,
the Colossians,
the Thessalonians, I.
the Thessalonians, II.
Timothy, I.
Timothy, II.
Titus,
Philemon,
the Hebrews,
St James,
St Peter, I.
St Peter, II.
St John, I.
St John, II.
St John III.
St Jude,

The general Epistle of

The Revelation of St John.

The apocryphal books of the Old Testament, according to the Romanists, are, the book of Enoch (see Jude 14.), the third and fourth books of Esdras, the third and fourth books of Maccabees, the prayer of Manasseh, the Testament of the twelve patriarchs, the Psalter of Solomon, and some other pieces of this nature.

The apocryphal books of the New Testament are, the epistle of St Barnabas, the pretended epistle of St Paul to the Laodiceans, several spurious gospels, Acts of the Apostles, and Revelations; the book of Hermas, intitled, the Shepherd, Jesus Christ's Letter to Abgarus, the epistles of St Paul to Seneca, and several other pieces of the like nature, as may be seen in the collection of the apocryphal writings of the New Testament made by Fabricius.

The books which are now lost and cited in the Old Testament

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Testament are these, the book of the *Righteous*, or of Jasher, as our version of the Bible has it (Josh. x. 13. and 2 Sam. i. 18.); the book of the wars of the Lord, (Numb. xxi. 14.); the annals of the kings of Israel, so often cited in the books of the Kings and Chronicles. The authors of these annals were the prophets, who lived in the kingdoms of Judah and Israel. We have likewise but a part of Solomon's 3000 proverbs and his 1005 songs, (1 Kings iv. 32.); and we have entirely lost what he wrote upon plants, animals, birds, fishes, and reptiles.

Ezra, in the opinion of most learned men, published the scriptures in the Chaldee character: for that language being grown wholly into use among the Jews, he thought proper to change the old Hebrew character for it, which hath since that time been retained only by the Samaritans, among whom it is preserved to this day.

Prideaux is of opinion that Ezra made additions in several parts of the Bible, where any thing appeared necessary for illustrating, connecting, or completing, the work; in which he appears to have been assisted by the same spirit in which they were first written. Among such additions are to be reckoned the last chapter of Deuteronomy, wherein Moses seems to give an account of his own death and burial, and the succession of Joshua after him. To the same cause our learned author thinks are to be attributed many other interpolations in the Bible, which created difficulties and objections to the authenticity of the sacred text, no ways to be solved without allowing them. Ezra changed the names of several places which were grown obsolete, and instead of them put their new names, by which they were then called in the text. Thus it is that Abraham is said to have pursued the kings who carried Lot away captive, as far as Dan; whereas that place in Moses's time was called *Laiſh*; the name *Dan* being unknown till the Danites, long after the death of Moses, possessed themselves of it.

The Jewish canon of Scripture was then settled by Ezra, yet not so but that several variations have been made in it. Malachi, for instance, could not be put in the Bible by him, since that prophet is allowed to have lived after Ezra; nor could Nehemiah be there, since mention is made, in that book, of Jaddus, as high-priest, and of Darius Codomannus, as king of Persia, who were at least 100 years later than Ezra. It may be added, that in the first book of Chronicles, the genealogy of the sons of Zerubbabel is carried down for so many generations as must necessarily bring it to the time of Alexander, and consequently this book could not be in the canon in Ezra's days. It is probable, the two books of Chronicles, Ezra, Nehemiah, Esther, and Malachi, were adopted into the Bible in the time of Simon the Just, the last of the men of the great synagogue.

The Jews, at first, were very reserved in communicating their scripture to strangers: despising and shunning the Gentiles, they would not disclose to them any of the treasures concealed in the Bible. We may add, that the people bordering on the Jews, as the Egyptians, Phœnicians, Arabs, &c. were not very curious to know the laws or history of a people, whom in their turn they hated and despised. Their first acquaintance with these books was not till after the se-

veral captivities of the Jews; when the singularity of the Hebrew laws and ceremonies induced several to desire a more particular knowledge of them. Josephus seems surprised to find such slight foot-steps of the scripture-history interspersed in the Egyptian, Chaldean, Phœnician, and Grecian history; and accounts for it hence, that the sacred books were not as yet translated into Greek or other languages, and consequently not known to the writers of those nations.

The first version of the Bible was that of the *SEPTUAGINT* into Greek, in the time of Ptolemy Philadelphus; though some maintain that the whole was not then translated, but only the Pentateuch; between which and the other books in the version called of the Seventy, the critics find a great diversity in point of style and expression, as well as of accuracy.

Hebrew Bibles, are either manuscript or printed. The best manuscript Bibles are those copied by the Jews of Spain. Those copied by the Jews of Germany are less exact, but more common. The two kinds are easily distinguished from each other; the former being in beautiful characters, like the Hebrew Bibles of Bomberg, Stephens, and Plantin; the latter in characters like those of Munſter and Gryphius. F. Simon observes, that the oldest manuscript Hebrew Bibles are not above six or seven hundred years old; nor does rabbi Menahem, who quotes a vast number of them, pretend that any of them exceed six hundred years.

Dr Kennicot, in his *Dissertatio Generalis* prefixed to his Hebrew Bible, p. 21, observes, that the most ancient manuscripts were written between the years 900 and 1100: but though those that are the most ancient are not more than 800 or 900 years old, they were transcribed from others of a much more ancient date. The manuscript preserved in the Bodleian library is not less than 800 years old. Another manuscript, not less ancient, is preserved in the Cæsarean library at Vienna.

The most ancient printed Hebrew Bibles are those published by the Jews of Italy, especially of Pesaro and Bressia. Those of Portugal also printed some parts of the Bible at Lisbon, before their expulsion.—This may be observed in the general, that the best Hebrew Bibles are those printed under the inspection of the Jews; there being so many *minutiae* to be observed, that it is scarce possible for any other to succeed in it.

In the beginning of the 16th century Dan. Bomberg printed several Hebrew Bibles in folio and quarto at Venice, most of which are esteemed both by the Jews and Christians: the first in 1517, which is the least exact, and generally goes by the name of Felix Pratensis, the person who revised it. This edition contains the Hebrew text, the targum, and the commentaries of several rabbins. In 1528, the same Bomberg printed the folio Bible of rabbi Benchajim, with his preface, the masoretical divisions, a preface of Aben Ezra, a double *masora*, and several various readings. The third edition was printed in 1618; it is the same with the second, but much more correct. From the former editions it was, that Buxtorf, the father, printed his rabbinical Hebrew Bible at Basil in 1618; which though there are many faults in it, is

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more correct than any of the former. In 1623 appeared at Venice a new edition of the rabbinical Bible by Leo of Modena, a rabbin of that city, who pretended to have corrected a great number of faults in the former edition; but, besides that it is much inferior to the other Hebrew Bibles of Venice, with regard to paper and print, it has passed through the hands of the inquirers, who have altered many passages in the commentaries of the rabbins.

As to Hebrew Bibles in 4to, that of R. Stephens is esteemed for the beauty of the characters; but it is very incorrect. Plantin also printed several beautiful Hebrew Bibles at Antwerp: one, in eight columns, with a preface by Arias Montanus in 1571, which far exceeds the Complutensian in paper and print, and contents; this is called the Royal Bible, because it was printed at the expence of Philip II. of Spain: another at Geneva in 1619; besides many more of different sizes, with and without points. Manasseh Ben Israel, a learned Portuguese Jew, published two editions of the Hebrew Bible at Amsterdam; the one in 4to in 1635; the other in 8vo in 1639: the first has two columns, and for that reason is commodious for the reader. In 1639, R. Jac. Lombroso published a new edition in 4to at Venice, with small literal notes at the bottom of each page, where he explains the Hebrew words by Spanish words. This bible is much esteemed by the Jews at Constantinople: in the text they have distinguished between words where the point *camets* is to be read with a *camets katuph*, that is, by *o*, and not an *a*.

Of all the editions of the Hebrew Bible in 8vo, the most beautiful and correct are the two of Jo. Athias, a Jew of Amsterdam. The first, of 1661, is the best paper; but that of 1667 is the most exact: that, however, published since at Amsterdam by Vander Hooght, in 1705, is preferable to any of them.

After Athias, three Hebraizing Protestants engaged in revising and publishing the Hebrew Bible; viz. Clodius, Jablonski, and Opatius.—Clodius's edition was published at Franckfort in 1677, in 4to. At the bottom of the page it has the various readings of the former editions; but the author does not appear sufficiently versed in the accenting, especially in the poetical books; besides, as it was not published under his eye, many faults have crept in. That of Jablonski in 1699, in 4to, at Berlin, is very beautiful as to letter and print: but, though the editor pretends he made use of the editions of Athias and Clodius, some critics find it scarce in any thing different from the 4to edition of Bomberg. That of Opatius is also in 4to at Keil, in 1709; the character is large and good, but the paper bad: it is done with a great deal of care; but the editor made use of no manuscripts but those of the German libraries; neglecting the French ones, which is an omission common to all three. They have this advantage, however, that besides the divisions used by the Jews, both general and particular, into *parafkes* and *pesukim*, they have also those of the Christians, or of the Latin Bibles, into chapters and verses; the *keri ketib*, or various readings, Latin summaries, &c. which made them of considerable use, with respect to the Latin editions and the concordances.

The little Bible of R. Stephens, in 16to, is very much prized for the beauty of the character. Care,

however, must be taken; there being another edition of Geneva exceedingly like it, excepting that the print is worse, and the text less correct. To these may be added some other Hebrew Bibles without points, in 8vo and 24to, which are much coveted by the Jews; not that they are more exact, but more portable than the rest, and are used in their synagogues and schools: of these there are two beautiful editions, the one of Plantin, in 8vo, with two columns, and the other in 24to, reprinted by Raphalengius at Leyden in 1610. There is also an edition of them by Laurens at Amsterdam in 1631, in a larger character; and another in 12mo, at Franckfort, in 1694, full of faults, with a preface of M. Leusden at the head of it.

Houbigant published an elegant edition of the Hebrew Bible at Paris in 1753, contained in four vols. folio. The text is that of Van der Hooght, without points, to which he has added marginal notes, supplying the variations of the Samaritan copy. Dr Kennicott, after almost 20 years laborious collation of near 700 copies, manuscript and printed, either of the whole or of particular parts of the Bible, did, in 1776, publish the first volume of the Hebrew Bible in folio. The text is that of Everard Van der Hooght, already mentioned, differing from it only in the disposition of the poetical parts, which Dr Kennicott has printed in hemistichs, into which they naturally divide themselves; however, the words follow one another in the same order as they do in the edition of Van der Hooght. This edition is printed on an excellent type; the Samaritan text, according to the copy in the London Polyglot, is exhibited in a column parallel with the Hebrew text; those parts of it only being introduced in which it differs from the Hebrew. The numerous variations both of the Samaritan manuscripts from the printed copy of the Samaritan texts, and of the Hebrew manuscripts from the printed text of Van der Hooght, are placed separately at the bottom of the page, and marked with numbers referring to the copies from which they are taken. The editor regrets, that the dissertation generalis, which would help much to enrich this article, is not to be published till the second volume is ready.

Greek Bibles.—There is a great number of editions of the Bible in Greek; but they may be all reduced to three or four principal ones, viz. that of Complutum, or Alcala de Henares, that of Venice, that of Rome, and that of Oxford. The first was published in 1515, by Cardinal Ximenes, and inserted in the Polyglot Bible, usually called the *Complutensian Bible*: this edition is not just, the Greek of the Seventy being altered in many places according to the Hebrew text. It has, however, been reprinted in the Polyglot Bible of Antwerp, in that of Paris, and in the 4to Bible, commonly called *Vatablus's Bible*.

The second Greek Bible is that of Venice, printed by Aldus in 1518. Here the Greek text of the Septuagint is reprinted just as it stood in the manuscript, full of faults of the copyists, but easily amended. This edition was reprinted at Strasburg in 1526, at Basil in 1545, at Franckfort in 1597, and other places, with some alterations to bring it nearer the Hebrew. The most commodious is that of Franckfort; there being added to this little *scholia*, which show the different interpretations of the old Greek translators: the author of this collection has not added his name, but it is commonly ascribed to Junius.

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The third Greek Bible is that of Rome, or the Vatican, in 1587, with Greek *scholia* collected from the manuscripts in the Roman libraries by Pet. Morin. It was first set on foot by Cardinal Montalbo, afterwards Pope Sextus Quintus. This fine edition has been reprinted at Paris in 1628 by J. Morin, priest of the oratory, who has added the Latin translation, which in the Roman was printed separately with *scholia*. The Greek edition of Rome has been printed in the Polyglot Bible of London; to which are added, at bottom, the various readings of the Alexandrian manuscript. This has been also reprinted in England in 4to and 12mo, with some alterations. It has been again published at Franeker in 1709 by Bos, who has added all the various readings he could find.

The fourth Greek Bible is that done from the Alexandrian manuscript, begun at Oxford by Dr Grabe in 1707. In this the Alexandrian manuscript is not printed such as it is, but such as it was thought it should be; *i. e.* it is altered wherever there appeared any fault of the copyists, or any word inserted from any particular dialect: this some think an excellence, but others a fault; urging, that the manuscript should have been given absolutely and entirely of itself, and all conjectures as to the readings should have been thrown into the notes.

Latin Bibles, how numerous soever, may be all reduced to three classes; the ancient vulgate, called also *Italica*, translated from the Greek Septuagint; the modern vulgate, the greatest part of which is done from the Hebrew text; and the new Latin translations, done also from the Hebrew text, in the 16th century. We have nothing remaining of the ancient vulgate, used in the primitive times in the western churches, but the Psalms, Wisdom, and Ecclesiastes. Nobilius has endeavoured to retrieve it from the works of the ancient Latin fathers; but it was impossible to do it exactly, because most of the fathers did not keep close to it in their citations.

As to the modern vulgate, there are a vast number of editions very different from each other. Cardinal Ximenes has inserted one in the Bible of Complutum, corrected and altered in many places. R. Stephens, and the doctors of Louvain, have taken great pains in correcting the modern vulgate.

The best edition of Stephens's Latin Bible is that of 1540, reprinted in 1545, in which are added on the margin the various readings of several Latin manuscripts which he had consulted. The doctors of Louvain revised the modern vulgate after R. Stephens; and added the various readings of several Latin manuscripts. The best of the Louvain editions are those at the end of which are added the critical notes of Francis Lucas of Bruges.

All these reformations of the Latin Bible were made before the time of Pope Sixtus V. and Clement VIII. since which people have not dared to make any alterations, excepting in comments and separate notes. The correction of Clement VIII. in 1592, is now the standard throughout all the Romish churches: that pontiff made two reformations; but it is the first of them that is followed. From this the Bibles of Plantin were done, and from those of Plantin all the rest; so that the common Bibles have none of the after corrections of the same Clement VIII. It is a heavy

charge that lies on the editions of Pope Clement, viz. that they have some new texts added, and many old ones altered, to countenance and confirm what they call the Catholic doctrine; witness that celebrated passage of St John, *tres sunt*, &c. There are a great number of Latin Bibles of the third class, comprehending the versions from the originals of the sacred books made within these 200 years. The first is that of Santes Pagninus, a Dominican, under the patronage of Pope Leo X. printed at Lyons, in 4to, in 1527, much esteemed by the Jews. This the author improved in a second edition. In 1542, there was a beautiful edition of the same at Lyons, in folio, with *scholia*, published under the name of Michael Villanovanus, *i. e.* Michael Servetus, author of the *scholia*. Those of Zurich have likewise published an edition of Pagninus's Bible in 4to; and R. Stephens reprinted it in folio, with the vulgate, in 1557, pretending to give it more correct than in the former editions. There is also another edition of 1586, in four columns, under the name of *Vatablus*: and we find it again in the Hamburgh edition of the Bible in four languages.

In the number of Latin Bibles is also usually ranked the version of the same Pagninus corrected, or rather rendered literal, by Arias Montanus; which correction being approved of by the doctors of Louvain, &c. was inserted in the Polyglot Bible of Philip II. and since in that of London. There have been various editions of this in folio, 4to, and 8vo; to which have been added the Hebrew text of the Old Testament, and the Greek of the New. The best of them all is the first, which is in folio, 1571.

Since the Reformation there have been several Latin versions of the Bible from the originals by Protestants. The most esteemed are those of Munster, Leo Juda, Castalio, and Tremellius; the three last whereof have been reprinted various times. Munster published his version at Basil in 1534, which he afterwards revised; he published a correct edition in 1546. Castalio's fine Latin pleases most people; but there are some who think it too much affected; the best edition thereof is that in 1573. Leo Juda's version altered a little by the divines of Salamanca, was added to the ancient Latin edition, as published by R. Stephens, with notes, under the name of *Vatablus's Bible*, in 1545. It was condemned by the Parisian divines, but printed with some alterations by the Spanish divines of Salamanca. That of Junius and Tremellius is preferred, especially by the Calvinists, and has undergone a great number of editions.

One may add a fourth class of Latin Bibles, comprehending the vulgate edition corrected from the originals. The Bible of Isidorus Clarus is of this number: that author, not being contented with restoring the ancient Latin copy, has corrected the translator in a great number of places, which he thought ill rendered. Some Protestants have followed the same method; and among others, Andrew and Luke Osiander, who have each published a new edition of the vulgate, corrected from the originals.

Oriental Bibles.—At the head of the Oriental versions of the Bible must be placed the Samaritan; as being the most ancient of all, though neither its age nor author have been yet ascertained, and admitting no more for holy scripture but the Pentateuch, or five books.

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books of Moses. This translation is made from the Samaritan Hebrew text, which is a little different from the Hebrew text of the Jews. This version has never been printed alone; nor any where but in the Polyglots of London and Paris.

Chaldee BIBLES, are only the glosses or expositions made by the Jews in the time when they spake the Chaldee tongue. These they call by the name of *Targumim*, or *paraphrases*, as not being any strict versions of the Scripture. They have been inserted entire in the large Hebrew Bibles of Venice and Basil; but are read more commodiously in the Polyglots, being there attended with a Latin translation.

Syriac BIBLES.—There are extant two versions of the Old Testament in the Syriac language: one from the Septuagint, which is ancient, and made probably about the time of Constantine; the other called *antiqua et simplex*, made from the Hebrew, as some suppose, about the time of the apostles. This version is printed in the Polyglots of London and Paris.

In the year 1562, Widmanstadius printed the whole New Testament in Syriac, at Vienna, in a beautiful character: after him there were several other editions; and it was inserted in the Bible of Philip II. with a Latin translation. Gabriel Sionita also published a beautiful Syriac edition of the Psalms, at Paris, in 1525, with a Latin interpretation.

Arabic BIBLES.—In the year 1516, Aug. Justinian, bishop of Nebio, printed at Genoa an Arabic version of the Psalter, with the Hebrew text and Chaldee paraphrase, adding Latin interpretations. There are also Arabic versions of the whole scriptures in the Polyglots of London and Paris; and we have an edition of the Old Testament entire, printed at Rome in 1671, by order of the congregation *de propaganda fide*; but it is of little esteem, as having been altered agreeably to the vulgate edition. The Arabic Bibles among us are not the same with those used with the Christians in the East. Some learned men take the Arabic version of the Old Testament, printed in the Polyglots, to be that of Saadiah, who lived about the year 900; at least in the main. Their reason is, that Aben Ezra, a great antagonist of Saadiah, quotes some passages of his version, which are the same with those in the Arabic version of the Polyglots; yet others are of opinion, that Saadiah's version is not extant. In 1622, Erpenius printed an Arabic Pentateuch, called also the Pentateuch of Mauritana, as being made by the Jews of Barbary, and for their use. This version is very literal, and esteemed very exact. The four Evangelists have also been published in Arabic, with a Latin version, at Rome, in 1591, folio. These have been since reprinted in the Polyglots of London and Paris, with some little alterations of Gabriel Sionita. Erpenius published an Arabic New Testament entire, as he found it in his manuscript copy, at Leyden, in 1616.

There are some other Arabic versions of late date mentioned by Walton in his Prolegomena; particularly a version of the Psalms preserved in Sion College, London, and another of the Prophets at Oxford; neither of which have been published.

Coptic BIBLES.—There are several manuscript copies of the Coptic Bible in some of the great libraries, especially in that of the French king. Dr Wilkins published the Coptic New Testament in 4to in the

year 1716, and the Pentateuch also in 4to in 1731, with Latin translations. He reckons these versions to have been made in the end of the second, or the beginning of the third century.

Ethiopic BIBLES.—The Ethiopians have also translated the Bible into their language.—There have been printed separately, the Psalms, Canticles, some chapters of Genesis, Ruth, Joel, Jonah, Zephaniah, Malachi, and the New Testament; all which have been since reprinted in the Polyglot of London. As to the Ethiopic New Testament, which was first printed at Rome in 1548, it is a very inaccurate work, and is reprinted in the English Polyglot with all its faults.

Armenian BIBLES.—There is a very ancient Armenian version of the whole Bible, done from the Greek of the Seventy, by some of their doctors about the time of Chrysostom. This was first printed entire in 1664, by one of their bishops at Amsterdam, in 4to; with the New Testament in 8vo.

Persian BIBLES.—Some of the fathers seem to say, that all the scripture was formerly translated into the language of the Persians; but we have nothing now remaining of the ancient versions, which was certainly done from the Septuagint. The Persian Pentateuch printed in the London Polyglot is, without doubt, the work of Rabbi Jacob, a Persian Jew. It was published by the Jews at Constantinople, in the year 1551. In the same Polyglot we have likewise the four Evangelists in Persian, with a Latin translation; but this appears very modern, incorrect, and of little use. Wilton says this version was written above 400 years ago. Another version of the Gospels was published at Cambridge by Wheloc in the last century: there are also two Persian versions of the Psalms made in the last century from the vulgar Latin.

Gothic BIBLES.—It is generally said, that Ulphilas, a Gothic bishop, who lived in the fourth century, made a version of the whole Bible, excepting the book of Kings, for the use of his countrymen. That book he omitted, because of the frequent mention of the wars therein; as fearing to inspire too much of the military genius into that people. We have nothing remaining of this version but the four Evangelists, printed in 4to, at Dort, in 1665, from a very ancient MS.

WHILST the Roman empire subsisted in Europe, the reading of the Scriptures in the Latin tongue, which was the universal language of that empire, prevailed every where. But since the face of affairs in Europe has been changed, and so many different monarchies erected upon the ruins of the Roman empire, the Latin tongue has by degrees grown into disuse: whence has arisen a necessity of translating the Bible into the respective languages of each people; and this has produced as many different versions of the Scriptures in the modern languages, as there are different nations professing the Christian religion. Hence we meet with French, Italian, Spanish, German, Flemish, Danish, Slavonian, Polish, Bohemian, and Russian or Muscovite Bibles; besides the Anglo-Saxon, and modern English and Irish Bibles.

French BIBLES. The oldest French Bible we hear of is the version of Peter de Vaux, chief of the Waldenses, who lived about the year 1160. Raoul de Presle translated the Bible into French in the reign of Charles V.

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king of France, about the year 1380. Besides these, there are several old French translations of particular parts of the Scripture. The doctors of Louvain published the Bible in French at Louvain by order of the emperor Charles V. in 1550. There is a version by Isaac le Maître de Sacy, published in 1672, with explanations of the literal and spiritual meaning of the text, which was received with wonderful applause, and has been often reprinted. As to the New Testaments in French, which have been printed separately, one of the most remarkable is that of F. Amelotte of the oratory, composed by the direction of some French prelates, and printed with annotations in the year 1666, 1667, and 1670. The author pretends he had been at the pains to search all the libraries in Europe, and collate the oldest manuscripts. But, in examining his work, it appears that he has produced no considerable various readings, which had not before been taken notice of either in the London Polyglott or elsewhere. The New Testament of Mons printed in 1665, with the archbishop of Cambray's permission, and the king of Spain's licence, made a great noise in the world. It was condemned by Pope Clement IX. in 1668, and by Pope Innocent XI. in 1679, and in several bishoprics of France at several times. The new Testament published at Trevoux in 1702, by M. Simon, with literal and critical annotations upon difficult passages, was condemned by the bishops of Paris and Meux in 1702. F. Bohours, a Jesuit, with the assistance of F. F. Michael Tellier, and Peter Bernier, Jesuits likewise, published a translation of the New Testament in 1697: but this translation is, for the most part, harsh and obscure, which was owing to the author's keeping too strictly to the Latin text from which he translated.

There are likewise French translations published by Protestant authors; one by Robert Peter Olivetan, printed at Geneva in 1535, and since often reprinted with the corrections of John Calvin and others; another by Sebastian Castalio, remarkable for particular ways of expression never used by good judges of the language. John Diodati likewise published a French Bible at Geneva in 1644; but some find fault with his method, in that he rather paraphrases the text than translates it. Faber Stapalensis translated the New Testament into French, which was revised and accommodated to the use of the reformed churches in Piedmont, and printed in 1534. Lastly, M. John Le Clerc published a New Testament in French at Amsterdam in 1703, with annotations taken chiefly from Grotius and Hammond; but the use of this version was prohibited in Holland by order of the States-General, as tending to revive the errors of Sabellius and Socinus.

Italian BIBLES. The first Italian Bible published by the Romanists is that of Nicholas Malerme, a Benedictine monk, printed at Venice in 1471. It was translated from the Vulgate. The version of Anthony Brucioli, published at Venice in 1532, was prohibited by the Council of Trent. The Calvinists likewise have their Italian Bibles. There is one of John Diodati in 1607 and 1641, and another of Maximus Theophilus in 1551, dedicated to Francis de Medicis Duke of Tuscany. The Jews of Italy have no entire version of the Bible in Italian; the inquisition constantly refusing to allow them the liberty of printing one.

Spanish BIBLES. The first Spanish Bible that we hear

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of is that mentioned by Cyprian de Valera, which he says was published about the year 1500. The Epistles and Gospels were published in that language by Ambrose de Montefin in 1512; the whole Bible by Cassiodore de Reyna, a Calvinist, in 1569; and the New Testament, dedicated to the emperor Charles V. by Francis Enzinas, otherwise called *Driander*, in 1543. The first Bible which was printed in Spanish for the use of the Jews was that printed at Ferrara in 1553, in Gothic characters, and dedicated to Hercules d'Est Duke of Ferrara. This version is very ancient, and was probably in use among the Jews of Spain before Ferdinand and Isabella expelled them out of their dominions in 1492.

German BIBLES. The first and most ancient translation of the Bible in the German language is that of Ulphilas bishop of the Goths, about the year 360. This bishop left out the book of Kings, which treat chiefly of war, lest it should too much encourage the martial humour of the Goths. An imperfect manuscript of this version was found in the abbey of Verden near Cologne, written in letters of silver, for which reason it is called *Codex Argenteus*; and it was published by Francis Junius in 1665. The oldest German printed Bible extant is that of Nuremberg, printed in 1447; but who the author of it was is uncertain. John Emzer, chaplain to George Duke of Saxony, published a version of the New Testament in opposition to Luther. There is a German Bible of John Eckius in 1537, with Emzer's New Testament added to it; and one by Ulemburgius of Westphalia, procured by Ferdinand Duke of Bavaria, and printed in 1630. Martin Luther having employed eleven years in translating the Old and New Testament, published the Pentateuch in 1522, the historical books and the Psalms in 1524, the books of Solomon in 1527, Isaiah in 1529, the Prophets in 1531, and the other books in 1530: he published the New Testament in 1522. The learned agree, that his language is pure, and the version clear and free from intricacies: it was revised by several persons of quality, who were masters of all the delicacies of the German language. The German Bibles which have been printed in Saxony, Switzerland, and elsewhere, are for the most part the same with that of Luther, with very little variation. In 1604 John Piscator published a version of the Bible in German, taken from that of Junius and Tremellius: but his turn of expression is purely Latin, and not at all agreeable to the genius of the German language: the Anabaptists have a German Bible printed at Worms in 1529. John Crellius published his version of the New Testament at Racovia in 1630; and Felbinger his at Amsterdam in 1660.

Flemish BIBLES. The Flemish Bibles of the Romanists are very numerous, and for the most part have no author's name prefixed to them, till that of Nicolas Vinck, printed at Lovain in 1548. The Flemish versions made use of by the Calvinists till the year 1637, were copied principally from that of Luther. But the synod of Dort having in 1618 appointed a new translation of the Bible into Flemish, deputies were named for the work, which was not finished till the year 1637.

Danish BIBLES. The first Danish Bible was published by Peter Palladius, Olaus Chrysostom, John Synnigius, and John Maccabæus, in 1550, in which they followed

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lowed Luther's first German version. There are two other versions, the one by John Paul Resenius bishop of Zealand, in 1605; the other, being the New Testament only, by John Michel, in 1524.

Swedish Bible. In 1534 Olaus and Laurence published a Swedish Bible from the German version of Martin Luther. It was revised in 1617, by order of king Gustavus Adolphus, and was afterwards almost universally received.

Bohemian, Polish, Russian or Muscovite, and Slavonian Bibles. The Bohemians have a Bible translated by eight of their doctors, whom they had sent to the schools of Wirtemberg and Basil, on purpose to study the original languages. It was printed in Moravia in the year 1539. The first Polish version of the Bible, it is said, was that composed by Hadewich wife of Jagellon Duke of Lithuania, who embraced Christianity in the year 1390. In 1599 there was a Polish translation of the Bible published at Cracow, which was the work of several divines of that nation, and in which James Wieck, a Jesuit, had a principal share. The Protestants, in 1596, published a Polish Bible from Luther's German version, and dedicated it to Uladislaus IV. king of Poland. The Russians or Muscovites published the Bible in their language in 1581. It was translated from the Greek by St Cyril, the apostle of the Slavonians; but this old version being too obscure, Ernest Gliik, who had been carried prisoner to Moscow after the taking of Narva, undertook a new translation of the Bible in Slavonian; who dying in 1705, the Czar Peter appointed some particular divines to finish the translation: but whether it was ever printed, we cannot say.

English-Saxon Bibles. If we inquire into the versions of the Bible of our own country, we shall find that Adelm bishop of Sherburn, who lived in 709, made an English-Saxon version of the Psalms; and that Eadfrid, or Ecbert, bishop of Lindisferne, who lived about the year 730, translated several of the books of Scripture into the same language. It is said likewise, that venerable Bede, who died in 785, translated the whole Bible into Saxon. But Cuthbert, Bede's disciple, in the enumeration of his master's works, speaks only of his translation of the Gospel; and says nothing of the rest of the Bible. Some pretend, that King Alfred, who lived in 890, translated a great part of the Scriptures. We find an old version in the Anglo-Saxon of several books of the Bible, made by Elfric abbot of Malmesbury: it was published at Oxford in 1699. There is an old Anglo-Saxon version of the four Gospels, published by Matthew Parker archbishop of Canterbury in 1571, the author whereof is unknown. Dr Mill observes, that this version was made from a Latin copy of the old Vulgate.

Saxon Bibles.---The whole Scripture is said by some to have been translated into the Anglo-Saxon by Bede about the year 701, though others contend he only translated the Gospels.

We have certain books or parts of the Bible by several other translators; as, 1. The Psalms, by Adelm bishop of Shireborn, contemporary with Bede; though by others this version is attributed to King Alfred, who lived 200 years after. Another version of the Psalms in Anglo-Saxon was published by Spelman in 1640. 2. The Evangelists, still extant, done from the ancient

vulgate, before it was revised by St Jerom, by an author unknown, and published by Matth. Parker in 1571. An old Saxon version of several books of the Bible, made by Elfric abbot of Malmesbury, several fragments of which were published by Will. Lilly in 1638, the genuine copy by Edm. Thwaites in 1699, at Oxford.

Indian Bible.---A translation of the Bible into the North American Indian language by Elliot was published in 4to at Cambridge in 1685.

English Bibles.---The first English Bible we read of was that translated by J. Wickliffe about the year 1360; but never printed, though there are MS. copies of it in several of the public libraries. J. de Trevisa, who died about the year 1398, is also said to have translated the whole Bible; but whether any copies of it are remaining, does not appear.

Tindal's.---The first printed Bible in our language was that translated by Will. Tindal, assisted by Miles Coverdale, printed abroad in 1526; but most of the copies were bought up and burnt by Bishop Tunstall and Sir Thomas Moore. It only contained the New Testament, and was revised and republished by the same person in 1530. The prologues and prefaces added to it reflect on the bishops and clergy; but this edition was also suppressed, and the copies burnt. In 1532, Tindal and his associates finished the whole Bible except the apocrypha, and printed it abroad: but while he was afterwards preparing for a second edition, he was taken up and burnt for heresy in Flanders.

Matthew's.---On Tindal's death, his work was carried on by Coverdale, and John Rogers superintendant of an English church in Germany, and the first martyr in the reign of Queen Mary, who translated the Apocrypha, and revised Tindal's translation, comparing it with the Hebrew, Greek, Latin, and German, and adding prefaces and notes from Luther's Bible. He dedicated the whole to Henry VIII. in 1537, under the borrowed name of Thomas Matthews; whence this has been usually called *Matthew's Bible*. It was printed at Hamburgh, and licence obtained for publishing it in England by the favour of Archbishop Cranmer and the Bishops Latimer and Shaxton.

Cranmer's.---The first Bible printed by authority in England, and publicly set up in churches, was the same Tindal's version, revised, compared with the Hebrew, and in many places amended, by Miles Coverdale afterwards bishop of Exeter; and examined after him by archbishop Cranmer, who added a preface to it: whence this was called *Cranmer's Bible*. It was printed by Grafton, of the largest volume, and published in 1540; and, by a royal proclamation, every parish was obliged to set one of the copies in their church, under the penalty of 40 shillings a month; yet, two years after, the Popish bishops obtained its suppression of the King. It was restored under Edward VI. suppressed again under Queen Mary, and restored again in the first year of Queen Elizabeth, and a new edition of it given in 1562.

Geneva.---Some English exiles at Geneva in Queen Mary's reign, Coverdale, Goodman, Gilbie, Sampson, Cole, Whittingham, and Knox, made a new translation, printed there in 1560, the New Testament having been printed in 1557; hence called the *Geneva Bible*; containing the variations of readings, marginal annotations, &c. on account of which it was much valued.

Bibles.

Bible. lued by the puritan party in that and the following reigns.

Bishop's.---Archbishop Parker resolved on a new translation for the public use of the church, and engaged the bishops and other learned men to take each a share or portion. These being afterwards joined together, and printed with short annotations in 1568, in a large folio, made what was afterwards called the *Great English Bible*, and commonly the *Bishop's Bible*. The following year it was also published in 8vo, in a small but fine black letter: and here the chapters were divided into verses; but without any breaks for them, in which the method of the Geneva Bible was followed, which was the first English Bible where any distinction of verses was made. It was afterwards printed in large folio, with corrections, and several prolegomena, in 1572: this is called *Matthew Parker's Bible*. The initial letters of each translator's name were put at the end of his part: *e. gr.* at the end of the Pentateuch, W. E. for William Exon; that is, William bishop of Exeter, whose allotment ended there: at the end of Samuel, R. M. for Richard Menevensis, or bishop of St David's, to whom the second allotment fell: and the like of the rest. The Archbishop oversaw, directed, examined, and finished the whole. This translation was used in the churches for 40 years, though the Geneva Bible was more read in private houses, being printed above 30 times in as many years. King James bore it an inveterate hatred on account of the notes; which at the Hampton-court conference he charged as partial, untrue, seditious, &c. The Bishop's Bible too had its faults. The King frankly owned he had yet seen no good translation of the Bible in English; but he thought that of Geneva the worst of all.

Rhemish.---After the translation of the Bible by the bishops, two other private versions had been made of the New Testament: the first by Laur. Thomson, made from Beza's Latin edition, together with the notes of Beza, published in 1582 in 4to, and afterwards in 1589, varying very little from the Geneva Bible; the second by the Papists at Rheims in 1584, called the *Rhemish Bible*, or *Rhemish Translation*. These finding it impossible to keep the people from having the Scriptures in the vulgar tongue, resolved to give a version of their own as favourable to their cause as might be. It was printed on a large paper, with a fair letter and margin. One complaint against it was its retaining a multitude of Hebrew and Greek words untranslated, for want, as the editors express it, of proper and adequate terms in the English to render them by; as the words *azymes*, *tunike*, *rational*, *holocaust*, *prepuce*, *pasche*, &c. However, many of the copies were seized by the Queen's searchers and confiscated; and Th. Cartwright was solicited by secretary Walsingham to refute it: but, after a good progress made therein, Archbishop Whitgift prohibited his further proceeding therein, as judging it improper the doctrine of the church of England should be committed to the defence of a puritan, and appointed Dr Fulke in his place, who refuted the Rheimsists with great spirit and learning. Cartwright's refutation was also afterwards published in 1618, under Archbishop Abbot. About 30 years after their New Testament, the Roman Catholics published a translation of the Old at Doway, in 1609 and 1610, from the vulgate, with annotations; so that the

English Roman Catholics have now the whole Bible in their mother-tongue; though it is to be observed, they are forbidden to read it without a licence from their superiors.

King James's.---The last English Bible was that which proceeded from the Hampton-court conference in 1603, where many exceptions being made to the Bishop's Bible, King James gave order for a new one; not, as the preface expresses it, for a translation altogether new, nor yet to make of a bad one a good one, but to make a good one better, or of many good ones one best. Fifty-four learned persons were appointed for this office by the King, as appears by his letter to the archbishop, dated in 1604; which being three years before the translation was entered upon, it is probable seven of them were either dead or had declined the task, since Fuller's list of the translators makes but 47; who being ranged under six divisions, entered on their province in 1607. It was published in 1613, with a dedication to James, and a learned preface, and is commonly called *King James's Bible*. After this, all the other versions dropped and fell into disuse, except the Epistles and Gospels in the Common Prayer Book, which were still continued according to the Bishop's translation till the alteration of the liturgy in 1661, and the Psalms and Hymns, which are to this day continued as in the old version.

The judicious Selden, in his Table Talk, speaking of the Bible, says, "The English translation of the Bible is the best translation in the world, and renders the sense of the original best, taking in for the English translation the Bishop's Bible, as well as King James's. The translators in King James's time took an excellent way. That part of the Bible was given to him who was most excellent in such a tongue (as the Apocrypha to Andrew Downs), and then they met together, and one read the translation, the rest holding in their hands some Bible either of the learned tongues, or French, Spanish, Italian, &c. If they found any fault, they spoke; if not, he read on."

King James's Bible is that now read by authority in all the churches in Britain.

Welsh BIBLES.---There was a Welch translation of the Bible made from the original in the time of Queen Elizabeth, in consequence of a bill brought in to the house of commons for this purpose in 1563. It was printed in folio in 1588. Another version, which is the standard translation for that language, was printed in 1620. It is called *Parry's Bible*. An impression of this was printed in 1690, called *Bishop Lloyd's Bible*. These were in folio. The first 8vo impression of the Welch Bible was made in 1630.

Irish BIBLE.---Towards the middle of the 16th century, Bedell, bishop of Kilmore, set on foot a translation of the Old Testament into the Irish language; the New Testament and the Liturgy having been before translated into that language. The bishop appointed one King to execute this work, who, not understanding the oriental languages, was obliged to translate it from the English. This work was received by Bedell, who, after having compared the Irish translation with the English, compared the latter with the Hebrew, the LXX. and the Italian version of Diodati. When this work was finished, the bishop would have been himself at the charge of the impression, but his

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design was stopped upon advice given to the lord lieutenant and the archbishop of Canterbury, that it would prove a shameful thing for a nation to publish a Bible translated by such a despicable hand as King. However, the manuscript was not lost, for it went to press in the year 1685.

Erse BIBLE.---There is also (lately finished at Edinburgh) a version of the Bible in the Gaelic or Erse language.

BIBLIANDER (Theodore), professor of divinity at Zurich in the 16th century. As he understood the oriental languages, he set about a new edition of the Koran; the text of which he corrected, by collating the Arabic and Latin copies. To this edition he subjoined the life of Mahomet and his successors; and prefixed an apology by way of preface, which has been loudly exclaimed against.

BIBLIOGRAPHIA, a branch of archæographia, employed in the judging and perusing of ancient manuscripts, whether written in books, paper, or parchment.

The sense of it is now extended; and it signifies a work intended to give information concerning the first or best editions of books, and the ways of selecting and distinguishing them properly. In short, it is used for a *notitia* or description of printed books, either in the order of the alphabet, of the times when printed, or of the subject matters. In which sense, bibliographia amounts to much the same with what is otherwise called *bibliotheca*.

Literary journals afford also a kind of bibliographia.

BIBLIOMANCY, a kind of divination performed by means of the Bible. This amounts to much the same with what is otherwise called *sortes biblicæ* or *sortes sanctorum*. It consisted in taking passages of Scripture at hazard, and drawing indications thence concerning things future; as in Augustin's *tolle & lege*. It was much used at the consecration of bishops.---F. J. Davidius, a Jesuit, has published a bibliomancy under the borrowed name of *Veridicus Christianus*.

BIBLIOTHECA, in its original and proper sense, denotes a library or place for repositing books.

BIBLIOTHECA, in matters of literature, denotes a treatise giving an account of all the writers on a certain subject: thus, we have bibliothecas of theology, law, philosophy, &c.

There are likewise universal bibliothecas, which treat indifferently of all kinds of books; also select bibliothecas, which give account of none but authors of reputation.

Many of the bibliothecas agree, in most respects, with what are otherwise called memoirs or journals of literature, except that these last are confined to new books; but there are other bibliothecas, that differ in nothing from catalogues of the writers on certain subjects.

BIBLISTS, so the Roman Catholics call those Christians who make Scripture the sole rule of faith; in which sense, all Protestants either are or ought to be biblists.

BIBLUS, βίβλος, in betany, an aquatic plant in Egypt, called also *papyrus*; of the skin whereof the ancient Egyptians made their paper. See **PAPYRUS**.

BIBRACTE (anc. geog.), a citadel of the Ædui, according to Strabo; but Cæsar describes it as a town well fortified, very large and populous, and of the

greatest authority among that nation: Now *Beurest*, or Bevray; a desolate place four miles to the north-west of Autun.

BIBROCI (anc. geog.), an ancient people of Britain: Now the *Hundred of Bray* in Berks.

BICANER, a city of Asia, on the river Ganges, belonging to the great Mogul. E. Long. 87. 20. N. Lat. 28. 40.

BICE, or **BISE**, among painters, a blue colour prepared from the lapis armenus.

Bice bears the best body of all bright blues used in common work, as house-painting, &c. but it is the palest in colour. It works indifferently well, but inclines a little to sandy, and therefore requires good grinding. Next to ultramarine, which is too dear to be used in common work, it lies best near the eye of all other blues.

BICEPS, the name of several muscles: as the biceps humeri, or cubiti; biceps tibiæ; &c. See **ANATOMY**, *Table of the Muscles*.

BICESTER, a straggling town of Oxfordshire in England, seated on the road between Oxford and Buckingham.

BICHET, a quantity or measure of corn, which differs according to the places where it is used. The bichet is not a wooden measure, as the minot at Paris, or the bushel at London; but is compounded of several certain measures. It is used in many parts of France, &c.

BICLINIUM, in Roman antiquity, a chamber with two beds in it; or when two beds only were round a table.

BICORNES, an order of plants in the *fragmenta methodi naturalis* of Linnæus, so termed from the antheræ having in appearance two horns. See **BOTANY**.

BIDACHE, a town of Lower Navarre in France, seated on the river Bidouse. W. Long. 10. 0. N. Lat. 41. 31.

BIDAL, or **BIDALE**, in our ancient customs, denotes the invitation of friends to drink ale at some poor man's house, who in consideration hereof expects some contribution for his relief. This custom still obtains in the west of England, and is mentioned in some of our ancient statutes.

BIDDLE (John), one of the most eminent English writers among the Socinians, was born at Wotton-under-Edge in Gloucestershire, and educated in the free school of that place. Being a hopeful youth, he was taken notice of; particularly by Lord George Berkeley, who allowed him an exhibition of ten pounds a-year. This caused him vigorously to apply himself to his studies; and he was, while at school, author of a translation of Virgil's *Bucolics*, and of the two first satires of Juvenal. He continued at school till he was 13 years of age. However, having manifested in that early period a singular piety and contempt of secular affairs, he was sent to the university of Oxford, and entered a student in Magdalen hall. In 1641, the magistrates of Gloucester chose him master of the free school of that city; and he was much esteemed: but falling into some opinions concerning the Trinity different from those commonly received, and expressing his thoughts with too much freedom, he suffered various persecutions and imprisonments in the time of the commonwealth. During one of these confinements, which lasted for several years, being reduced

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reduced to great indigence, he was employed by Roger Daniel of London to correct the impression of the Greek Septuagint Bible, which that printer was about to publish with great accuracy. In 1651, the parliament published a general act of oblivion, which restored him to his full liberty. He was afterwards imprisoned on account of his tenets; and at last the Protector banished him for life to St Mary's castle in the isle of Scilly, and sent him thither in October 1655. Soon after, he was allowed 100 crowns a-year for subsistence. In 1658, he was set at full liberty. After the restoration of King Charles II. he was fined in 100 l. and each of his hearers in 20 l. to lie in prison till paid; which being put in execution, the want of the fresh air and exercise made him contract a disease, of which he died on the 22d of September 1662, in the 47th year of his age. His life was published in Latin in 1682, by Mr Farington of the Inner Temple, who represents him as possessed of extraordinary piety, charity, and humility. He would not discourse of those points in which he differed from others with those that did not appear religious according to their knowledge; and was a strict observer himself, and a severe exactor in others, of reverence in speaking of God and Christ. He had so happy a memory, that he retained word for word the whole New Testament, not only in English, but in Greek, as far as the fourth chapter of the Revelations of St John.

BIDDIFORD, a town of Devonshire, seated on the river Torridge, over which there is a fine stone-bridge with 24 arches. It is a large and populous place, and carries on a considerable trade. W. Long. 4. 10. N. Lat. 51. 10.

BIDDING, or **OFFERING**, denotes the raising the price of a thing at a sale or auction. The French calls this *enchirer*. It answers to what the Romans called *licitari*: they used to bid by holding up the hand or finger.

BIDDING is also used for proclaiming or notifying. In which sense we meet with *bidding of the BANNs*, the same with what is otherwise called *asking*.

BIDDING Prayer. It was one part of the office of the deacons in the primitive Christian church, to be a sort of monitors and directors of the people in the exercise of their public devotions in the church. To which end they made use of certain known forms of words, to give notice when each part of the service began. This was called by the Greeks *κηρυττειν*, and by the Latins *predicare*: which therefore do not ordinarily signify to preach, as some mistake it; but to perform the office of a crier (*κηρυξ*, or *præco*) in the assembly: whence Synesius and others call the deacons *ἱεροκηρυκτες*, the *holy criers* of the church, appointed to bid or exhort the congregation to pray and join in the several parts of the service of the church. Agreeable to this ancient practice is the form *Let us pray*, repeated before several of the prayers in the English liturgy.

BIDDING of the Beads, a charge or warning which the parish-priest gave to his parishioners at certain special times, to say so many pater-nosters, &c. on their beads.

BIDENS, **WATER-HEMP** **AGRIMONY**: A genus of the polygamia æqualis order, belonging to the syngenesia class of plants; and in the natural method ranking under the 49th order, *Compositæ-oppositifolia*. The

receptacle is paleaceous; the pappus has erect scabrous awns; and the calyx is imbricated. Of this genus Linnæus enumerates 13 species; but none of them appear to merit notice except the tripartita, frequently found by the sides of rivulets, ditches, and lakes, both in Scotland and England. This grows to the height of two feet; and hath its leaves divided into three, or often five, lanceolate serrated lobes, with yellow flowers, which are succeeded by flattish angular seeds, having two beards arising from the angles, which are hooked or barbed downwards; and generally they have another shorter beard arising from the middle of the back of the seed. "As this plant (says Mr Lightfoot †) is found by a chemical analysis to possess much the same qualities as the celebrated verbesina acmela, a plant belonging to a genus very nearly related to this, it is probable it would have the same good effects in expelling the stone and gravel. A decoction of this plant with alum dyes yarn of a yellow colour. The yarn must be first steeped in alum water, then dried and steeped in a decoction of the plant, and afterwards boiled in the decoction. The seeds have been known sometimes to destroy the *cyprinus auratus*, or gold-fish, by adhering to their gills and jaws."

BIDENTAL, in Roman antiquity, a place blasted with lightning; which was immediately consecrated by an haruspex, with the sacrifice of a bidens. This place was afterwards accounted sacred, and it was unlawful to enter it or to tread upon it; for which reason it was commonly surrounded with a ditch, wall, hedge, ropes, &c. See next article.

BIDENTALES, in Roman antiquity, priests instituted to perform certain ceremonies and expiations when thunder fell on any place. Their principal office was the sacrificing a sheep of two years old, which in Latin is called *bidens*; from whence the place struck with thunder got the name of *bidental*.

BIDENTES, in middle-age writers, denotes two-yearlings, or sheep of the second year. The wool of these bidentes, or two years old sheep, being the first sheering, was sometimes claimed as a heriot to the king, on the death of an abbot. Among the ancient Romans, the word was extended further to any sorts of beasts used for victims, especially those of that age: whence we meet with *fiæ bidentes*.

BIDET, a nag or little horse, formerly allowed each trooper and dragoon, for his baggage and other occasions. Bidets are grown into disuse, on account of the expences thereof, and the disorders frequently arising from those who attended on them, &c.

BIDIS, (anc. geog.), a small city of Sicily, not far from Syracuse, whose ruins are still to be seen in the territory of Syracuse, about 15 miles to the south-west, with a church called *S. Giovanni di Bidini*.

BIDLOO (Godfrey), author of several treatises in anatomy, was born at Amsterdam, March 12th, 1649. In 1688, he was professor of anatomy at the Hague; and, in 1694, at Leyden; when king William III. of England appointed him his physician; which he would not accept but on condition of holding his professorship, which was readily granted him. He published, in Latin, 1. The Anatomy of the human Body, demonstrated in 105 cuts, explained by the discoveries of the ancient and modern writers. 2. An Oration upon the Antiquity of Anatomy. 3. A Letter to Anthony Leewenhoeck.

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Bidloo.† *Flora Scœtica.*

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Leewenhoeck on the animals sometimes found in the liver of sheep and other animals. 4. Two Decades of Dissertations in Anatomy and Chirurgery; and other pieces. He died at Leyden, in April 1713.

BIDON, a liquid measure, containing about five pints of Paris, that is, about five quarts English wine-measure. It is seldom used but among ships crews.

BIE, (de Adrian), an eminent painter, was born at Liere in 1594. After learning the rudiments of the art from different masters, he travelled to Rome, where he spent six years in studying the works of the best masters. His industry was then rewarded with proportionable success; for he found encouragement among the most honourable persons at Rome, and in every part of Italy through which he travelled, from persons of the first distinction. His penciling was so exceedingly neat, and his touch and colouring so very delicate, that he was frequently employed to paint on jasper, agate, porphyry, and other precious materials.

BIEEZ, a town of Poland, in the palatinate of Cracovia, remarkable for its mines of vitriol. It is seated on the river Weseloke, in E. Long. 2. 21. N. Lat. 49. 50.

BIEL. See BIENNA.

BIELA, a town of Russia, and capital of a province of the same name, seated on the river Opschaw, in E. Long. 34. 55. N. Lat. 55. 0.

BIELA OSERO, or BELOZERO, a town of the Russian empire, capital of a duchy, and situated on a lake of the same name, at the mouth of the river Consa, in E. Long. 39. 10. N. Lat. 58. 55.

BIELA, a town of Piedmont in Italy, and capital of the Bellese near the river Cerva, in E. Long. 8. 3. N. Lat. 45. 22.

BIELSKI, a town of Poland, in the palatinate of Polachia, near one of the sources of the river Narew. E. Long. 22. 55. N. Lat. 53. 50.

BIELSKOI, a town of Russia, in the province of Smolensko. E. Long. 35. 5. N. Lat. 56. 40.

BIENNA, a town of Switzerland, seated on a lake of the same name. The inhabitants are Protestants, and in alliance with those of Bern, Soleure, and Friburg. E. Long. 7. 14. N. Lat. 47. 11.

BIENNIAL PLANTS; plants, as the title *biennial* imports, that are only of two years duration. Numerous plants are of this tribe, which being raised one year from seed, generally attain perfection either the same, or in about the period of a twelvemonth, or a little less or more, and the following spring or summer shoot up stalks, flower, and perfect seeds; soon after which they commonly perish; or if any particular sort survive another year, they assume a dwindling and straggling growth, and gradually die off; so that biennials are always in their prime the first or second summer. Biennials consist both of esculents and flower plants. Of the esculent kinds, the cabbage, savoy, carrot, parsnip, beet, onion, leek, &c. are biennials. Of the flowery tribe, the Canterbury-bell, French honey-suckle, wall-flower, stock-July-flower, sweet-William, China-pink, common-pink, matted-pink, carnation, scabious, holly-hock, tree-mallow, vervain-mallow, tree-primrose, honesty, or moonwort, &c. are all of the biennial tribe; all of which being sown in March, April, or May, rise the same year, and in spring following shoot up into stalks, flower, and perfect seeds in

autumn; after which most of them dwindle: though sometimes the wall-flowers, hollyhocks, carnations, pinks, will survive and flower the following year; but the plants become straggling, the flowers small and badly coloured: it is therefore eligible to raise a supply annually from seed; although wall-flowers, carnations, and pinks, may be continued by slips and layers.

BIER, a wooden machine for carrying the bodies of the dead to be buried. The word comes from the French *biere*, which signifies the same. It is called in Latin *feretrum*, a *ferendo*.—Among the Romans the common bier, whereon the poorer sort were carried, was called *sandapila*; that used for the richer sort *lectica*, *lectica funebris*, sometimes *lectus*. The former was only a sort of wooden chest, *vilis arca*, which was burnt with the body; the latter was enriched and gilded, for pomp. It was carried bare, or uncovered, when the person died a natural and easy death; when he was much disfigured or distorted, it was veiled or covered over.

BIER, is more particularly used for that whereon the bodies of saints are placed in the church to rest, and exposed to the veneration of the devout. This is also called, in middle-age writers, *lectus*, *feretrum*, *lectica*, and *loculus*; and was usually enriched with gold, silver, and precious stones, which was the cause that the bier of St Benedict was pillaged, and all its ornaments carried off.

BIEROLIET, a town of the Netherlands in Dutch Flanders, where William Bruckfield, or *Beukelings*, who invented the method of pickling herrings, died in 1397. E. Long. 3. 42. N. Lat. 51. 25.

BIFERÆ, plants that flower twice a-year, in spring and autumn, as is common between the tropics.

BIFRONS, a person double-fronted, or two-faced.

BIFRONS is more peculiarly an appellation of Janus, who was represented by the ancients with two faces, as being supposed to look both backwards and forwards: though other reasons for it are recited by Plutarch. Sometimes he was painted with four faces, *quadrisons*, as respecting the four seasons.

BIGA, in antiquity, a chariot drawn by two horses abreast. Chariot-races, with two horses, were introduced into the Olympic games in the 93d Olympiad: but the invention was much more ancient, as we find that the heroes in the Iliad fight from chariots of that kind. The moon, night, and the morning, are by mythologists supposed to be carried in *bigæ*, the sun in *quadrigæ*. Statues in *bigæ* were at first only allowed to the gods, then to conquerors in the Grecian games; under the Roman emperors, the like statues, with *bigæ*, were decreed and granted to great and well-deserving men, as a kind of half triumph, being erected in most public places of the city. Figures of *bigæ* were also struck on their coins. The drivers of *bigæ* were called *bigarii*; a marble bust of one Florus a *ligarius* is still seen at Rome.

BIGAMY, properly signifies being *twice married*; but with us is used as synonymous with polygamy, or having a plurality of wives at once. Such second marriage, the former husband or wife living, is simply void, and a mere nullity, by the ecclesiastical law of England: and yet the legislature has thought it just to make

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make it felony, by reason of its being so great a violation of the public economy and decency of a well ordered state. For polygamy can never be endured under any rational civil establishment, whatever specious reasons may be urged for it by the eastern nations, the fallaciousness of which has been fully proved by many sensible writers: but in northern countries the very nature of the climate seems to reclaim against it; it never having obtained in this part of the world, even from the time of our German ancestors, who, as Tacitus informs us, "*prope soli barbarorum singulis uxoribus contenti sunt.*" It is therefore punished by the laws both of ancient and modern Sweden with death. And in Britain it is enacted by statute 1 Jac. I. c. 11. that if any person being married, do afterwards marry again, the former husband or wife being alive, it is felony; but within the benefit of clergy. The first wife in this case shall not be admitted as an evidence against her husband, because she is the true wife; but the second may, for she indeed is no wife at all: and so, *vice versa*, of a second husband. This act makes an exception to five cases, in which such second marriage, though in the three first it is void, is yet no felony. 1. Where either party hath been continually abroad for seven years, whether the party in England hath notice of the other's being alive or no. 2. Where either of the parties hath been absent from the other seven years within this kingdom, and the remaining party hath had no knowledge of the other's being alive within that time. 3. Where there is a divorce (or separation *a mensa et thoro*) by sentence in the ecclesiastical court. 4. Where the first marriage is declared absolutely void by any such sentence, and the parties loosed *a vinculo*. Or, 5. Where either of the parties was under the age of consent at the time of the first marriage; for in such case the first marriage was voidable by the disagreement of either party, which the second marriage very clearly amounts to. But, if at the age of consent the parties had agreed to the marriage, which completes the contract, and is indeed the real marriage; and afterwards one of them should marry again; Judge Blackstone apprehends that such second marriage would be within the reason and penalties of the act.

BIGATI, in antiquity, a kind of ancient Roman silver coins, on one side whereof was represented a *biga*, or chariot drawn by two horses. The *bigatus* was properly the Roman denarius, whose impression, during the times of the commonwealth, was a chariot driven by Victory, and drawn either by two horses or four; according to which it was either denominated *bigatus* or *quidrigatus*.

BIGGLESWADE, a town in Bedfordshire in England, seated on the river Ivel, over which there is a handsome bridge. The town is much more considerable now than formerly, on account of its commodious inns for passengers, it lying on the principal road from London to York. W. Long. 0. 15. N. Lat. 52. 5.

BIGHT, among seamen, denotes one roll or round of a cable or rope, when coiled up.

BIGNON (Jerome), a French writer, was born at Paris in 1590. He gained an uncommon knowledge, under the care of his father, in philosophy, mathematics, history, civil law, and divinity, in a very short time; and was almost at the end of his studies at an age when

it is usual to send children to school. At ten years of age he gave the public a specimen of his learning, in a Description of the Holy Land; and two years after, he published a Discourse concerning the principal antiquities and curiosities of Rome; and A summary Treatise concerning the election of Popes. Henry IV. desired to see him, and appointed him page to the dauphin, who was afterwards Louis XIII. He appeared at court with all the politeness of manners imaginable. He wrote at that time a Treatise of the precedence of the kings of France, which he dedicated to Henry IV. who gave him an express order to continue his researches on that subject: but the death of that prince interrupted his design. He published, in 1613, the Formulae of Marculphus. He was in 1620 made advocate-general in the grand council; and discharged that post with such reputation, that the king nominated him some time after counsellor of state, and at last advocate-general in the parliament. He resigned his offices in 1641; and the year following was appointed chief library keeper of the king's library. He was obliged to resume his office of advocate-general, and held it till his death. He was employed in the most important affairs of state. At last this great man, who had always made religion the basis of his other virtues, died with the most exemplary devotion in 1656.

BIGNONIA, TRUMPET-FLOWER, or SCARLET JASMINE: A genus of the angiospermia order, belonging to the didynamia class of plants; and in the natural method ranking in the 40th order *Personate*. The calyx is quinquefid and cup-form: The corolla is bell-shaped at the throat, quinquefid, and bellied underneath: The filiqua is bilocular; and the seeds have membranous wings.

Species. Of this genus Linnæus enumerates 17 species; of which the following are the most remarkable: 1. The radicans, or climbing ash-leaved bignonia, is a native of Virginia and Canada. It rises 30 or 40 feet high, having pinnated opposite leaves of four pair of serrated lobes, and an odd one: all the shoots and branches being terminated by beautiful clusters of large trumpet-shaped scarlet flowers. The humming birds delight to feed on these flowers, and by thrusting themselves too far into them are sometimes caught. Of this species there is a variety with smaller flowers. 2. The semper-virens, or evergreen climbing Virginia bignonia, is a native of Virginia, Carolina, and the Bahama islands. The stalks are more slender than those of the former species; yet they rise, upon proper supports, to the height of 20 or 30 feet; the flowers are trumpet-shaped, erect, and of a yellow colour, proceeding from the sides and ends of the stalks and branches. 3. The catalpa is a native of the same countries. It hath a strong woody stem and branches, rising 20 feet high, ornamented with large heart-shaped leaves, five or six inches long, and almost as broad, placed by threes, with whitish yellow-striped flowers coming out in panicles towards the end of the branches. This deserves a place in all curious shrubberies, as during the summer season no tree makes a more beautiful appearance: for which reason it should be placed conspicuously; or some might be planted singly upon spacious lawns or other large opens of grass-ground, and permitted to take their natural growth. 4. The unguis, or claw-bignonia, a deciduous climber, is a native of Barbadoes and the other

Bignonia. other West India islands. It rises by the help of claw-like tendrils, the branches being very slender and weak; and by these it will over-top bushes, trees, &c. twenty or thirty feet high. The branches, however, show their natural tendency to aspire, for they wind about every thing that is near them: so that, together with the assistance nature has given them of tendrils, it is no wonder they arrive at so great an height. These branches, or rather stalks, have a smooth surface, are often of a reddish colour, particularly next the sun, and are very tough. The tendrils grow from the joints; they are bowed, and are divided into three parts. The leaves grow in pairs at the joints, and are four in number at each. These are of an oblong figure, have their edges entire, and are very ornamental to the plant; for they are of an elegant green colour: their under surface is much paler than their upper; and their footstalks, midrib, and veins, alter to a fine purple. The flowers are monopetalous and bell-shaped. The tube is very large, and the rim is divided and spreads open. They grow from the wings of the leaves in August, two usually at each joint; and they are succeeded in the countries where they grow naturally by long pods. 5. The capreolata, or tendril bignonia, a native of North America, is another fine climber, which rises by the assistance of tendrils or clasps. The leaves grow at the joints opposite by pairs, though those which appear at the bottom frequently come out singly. They are of an oblong figure, and continue on the plant all winter. The flowers are produced in August from the wings of the leaves; they are of the same nature, and of the shape nearly of the former; are large, of a yellow colour, and succeeded by short pods.

Culture and Propagation. Of the climbers: 1. If the shoots are laid upon the ground, and covered with a little mould, they will immediately strike root, and become good plants for setting out where they are wanted. 2. They will all grow by cuttings. The bottom part of the strongest young shoots is the best; and by this method plenty may be soon raised. 3. They are to be raised by seeds; but this is a tedious method, especially of the pinnated-leaved sorts; for it will be many years before the plants raised from seeds will blow. As to the catalpa, whoever has the convenience of a bark-bed may propagate it in plenty, 1. By cuttings; which being planted in pots, and plunged into the beds in the spring, will soon strike root, and may afterwards be so hardened to the open air, that they may be set abroad in the shade before the end of summer: in the beginning of October, they should be removed into a green-house, or under some shelter to be protected from the winter's frost. In the spring, after the bad weather is past, they may be turned out of the pots, and planted in the nursery-way, in a well sheltered place; and if the soil be rich, and rather inclined to be moist, it will be the better. Here they may stand for four or five years, the rows being dug in winter and weeded in summer, when they will be of a proper size to be planted out to stand. These cuttings will often grow in a rich, shady, moist, border; so that whoever can have plenty of them, should plant them pretty thick in such a place, and he may be tolerably sure, by this way, of raising many plants. 2. From seed; which must be procured from America, and should be

sown in a fine warm border of light rich mould, or else in pots or boxes; the seedling plants requiring more than a common care.

BIGORRE, a territory or county of France, in the province of Gascony. It is bounded on the east by the valley of Aure, the viscounty of Nebouffa Riviere Verdun, and Pardiac; by Bearn on the west; on the south, by the valleys of Broton and Penticouse in Arragon; and on the north, by the county of Riviere-Bas incorporated with Armagnac. It is 40 miles long from north to south, and 30 in breadth from east to west. It is divided into three parts, the mountains, the plains, and the Rustan. The mountains are inclosed between those of the valley of Aure on the east, those of Arragon on the south, and of Bearn on the west. This part contains two principal valleys, Lavedan and Barege. The valley of Bigorre is of an oval form, and has the hills of Rustan on the east. The remarkable town are Tarbes the capital, Bagneres, Lour, &c. The mountains are a barrier between France and Spain, and there are four different passages which the inhabitants are obliged to guard. Bigorre yields marble, jasper, stone, and slate; there are also mines of several sorts, but they are not worked. The rivers are the Adour, the Elches, the Arroset, and the Gave of Lavedan; there are also three lakes.

BIGOT, a person obstinately and perversely wedded to some opinion or practice, particularly of a religious nature. Camden, perhaps, has hit upon the true original of the word. He relates, that when Rollo, duke of Normandy, received Gisla, the daughter of Charles the Foolish, in marriage, together with the investiture of that dukedom, he would not submit to kiss Charles's foot: and when his friends urged him by all means to comply with that ceremony, he made answer in the English tongue, NE SE BY God, i. e. *Not so by God*. Upon which, the king and his courtiers deriding him, and corruptly repeating his answer, called him *bigot*; from whence the Normans were called, *bigodi*, or *bigots*.

BIGOT, in Italian *bigontia*, is used to denote a Venetian liquid measure, containing the fourth part of the amphora, or half the boot.

BIHAEZ, a strong town of Croatia in Hungary, seated in an isle formed by the river Anna, in E Long. 16. 2. N. Lat. 44. 35.

BILANDER, in navigation, a small merchant-ship with two masts, distinguished from other vessels of the same kind by the form of the main-sail. Few vessels are now rigged in the manner of bilanders; the name has been variously applied in different countries.

BILBILIS (anc. geog.), a town of Hispania Citerior, the birth-place of Martial; now supposed to be Calatajud in Arragon on the Xalon.

BILBOA, a large, handsome, and rich town of Spain, capital of Biscay, with a well frequented harbour. It is remarkable for the wholesomeness of its air and the fertility of the soil about it. The inhabitants have always preserved themselves from a mixture with the Jews and Moors; and therefore will admit no family to settle among them but who can prove themselves to be of Christian extraction, nor will they admit any slaves among them as in the other parts of Spain. The exports are wool, and sword blades, with some other manufactures of iron and steel. The town is seated at the

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the mouth of the river Ibaicabal, in W. Long. 4. 20. N. Lat. 43. 23.

BILBOWS, a punishment at sea, answering to the stocks at land. The offender is laid in irons, or stocks, which are more or less ponderous according to the quality of the offence of which he is guilty.

BILDESTON, a town of Suffolk in England, seated on a creek on the river Breton. The principal manufacture is in woollen goods, especially blankets. E. Long. 0. 45. N. Lat. 52. 20.

BILDGE of a ship, the bottom of her floor, or the breadth of the place the ship rests on when she is aground. Therefore, *bildge-water* is that which lies on her floor, and cannot go to the well of the pump: And *bildge-pumps*, or burr-pumps, are those that carry off the bildge-water. They likewise say the ship is *bildged*, when she has some of her timber struck off on a rock or anchor, and springs a leak.

BILE, a yellow, bitter juice, separated from the blood in the liver, collected in the porus bilarius and gall-bladder, and thence discharged by the common duct into the duodenum. See ANATOMY, n° 97, 98.

BILEDULGERID, or **BELAD AL JERID**, the Country of dates, a kingdom of Africa. It is almost of a square form, extending itself more than 80 leagues every way, from 28. 30. to 32. 50. north latitude, and from 6 to 12 degrees of west longitude. It is bounded on the north by the kingdom of Tunis, on the east by a ridge of lofty mountains which divide it from Tripoli and part of Gudamis, on the west by the countries of Zeb and Mezeb, and on the south by the province of Verghela. The whole country is barren, sandy, and mountainous, producing little or nothing besides dates, which grow here in such profusion, that the face of half the kingdom is covered over with date-trees, and from hence the whole country takes its name. The climate is hot and unhealthy: the people lean, swarthy, and shrivelled in their complexions; with their eyes inflamed, owing to the reflection of the sun-beams from the white hard soil: and the showers of dust and sand driven by the high winds that blow here at certain seasons are frequently so violent as to bury men and cattle under them. Another inconvenience with which the inhabitants are afflicted, for which no other reason is given besides their constant living on dates, is an inveterate scurvy in their gums, whence all their teeth drop out; though it frequently spreads over their whole bodies, and then they become the most unhappy and loathsome objects. They are almost entirely free from other diseases: so that, when not afflicted with this, they live to a good old age; though it is observable that they discover a furrowed countenance, shrivelled skin, hoary locks, and other symptoms of old age, very early in life, and before decrepitude, infirmity, or any decay of their faculties, appear. The plague is not known in Biledulgerid, though so frequent in Barbary, and though a constant intercourse is kept up between the two countries; whence it would seem, that in certain cases this terrible distemper is not so infectious as it is usually thought to be. The same may be said of the small-pox, a disease little less contagious and fatal in hot countries than the plague itself. The natives are represented as a lewd, treacherous, thievish, and savage people, who delight in murder and robbery.

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They are mostly a mixture of Africans and wild Arabs who mingled themselves with them. The former live with some regularity and civil order in a kind of villages composed of a number of little huts; the latter in tents, ranging from place to place in quest of food and plunder. The Arabs, who pride themselves in their superiority of birth and talents above the primitive inhabitants, are wholly independent and free, frequently hiring themselves in the service of the neighbouring princes at war; from which policy arise the most valuable branches of their public revenue, if any thing can be called common or public in a nation of lawless robbers. The rest pursue no other occupation besides hunting and plundering; the first of which is their common employment, especially hunting of ostriches, which are said to be of a prodigious stature in this country, and as high as a man mounted on a tall horse. The inhabitants eat the flesh of these animals; barter their feathers for corn, pulse, and other things they want; use their hearts in their necromantic and religious rites, their fat as a medicine of sovereign virtue, their talons for ear-pendants and other ornaments, and their skins they convert into pouches and knapsacks, so that not a part of the animal but is employed in some useful purpose. Besides dates and ostriches, the Arabs live likewise on the flesh of goats and camels; drinking either the liquor or broth in which that flesh is boiled, or the milk of their camels; for they seldom taste water, that element being more scarce in this country than milk itself. In the whole country there is scarce a town of any note, or even a stream of water that deserves notice, or that is not dried up half the year.

BILEVELT, a town of Germany, in the circle of Westphalia and county of Ravensburg, subject to the king of Prussia, in E. Long. 8. 20. N. Lat. 52. 0.

BILINGUIS, in a general sense, signifies one that speaks two languages; but in law, is used for a jury that passes in any case between an Englishman and a foreigner, whereof part ought to be English and part strangers.

BILIOUS, in general, denotes something belonging to, or partaking of, the nature of bile. Hence,

Bilious Fevers are those occasioned by the over copiousness or bad qualities of the bile.

BILL, in mechanics, an instrument made of iron, edged in the form of a crescent, and adapted to a handle. It is used by plumbers, to perform several parts of their work; by basket-makers, to cut the largest pieces of chestnut-trees and other wood: and by gardeners, to prune trees. When short, it is called a *hand bill*; and when long, a *hedge bill*.

BILL, in law, a declaration in writing, expressing either some wrong the complainant has suffered from the defendant, or a fault committed by the person complained of against some law or statute.---This bill is sometimes exhibited to justices at the general assizes, by way of indictment, or referred to others having jurisdiction; but is more generally addressed to the lord chancellor. It contains the fact complained of, the damage sustained, and a petition or process against the defendant for redress; and is used both in criminal and civil cases. In the former, the words *billa vera* are indorsed by the grand jury upon a presentment,

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implying that they find the same founded on probable evidence, and therefore worthy of further consideration.

In Scots law, every summary application in writing, by way of petition to the court of session, is called a *bill*.

BILL of Attainder. See ATTAINDER.

BILL of Appeal. See APPEAL.

BILL signifies also a paper, either written or printed, in very large characters, which is posted up in some open and public place, to give notice of the sale of any merchandize or ship, or of the failing of any vessel into foreign parts.

BILL, in trade, both wholesale and retail, as also among workmen, signifies an account of merchandizes or goods delivered to a person, or of work done for one.

BILL, in commerce, denotes a security for money under the hand and sometimes seal of the debtor, without any condition or forfeiture in case of non-performance; in which it is distinguished from a bond or obligation. It has been usually defined, a writing wherein one man is bound to another to pay a sum of money, on a day that is future, or presently on demand, according to the agreement of the parties at the time when it is drawn; on which, in case of failure, diligence or execution may be immediately done to force payment. These bills must be on stamped paper: if under L. 50, the stamp to be 6d.; if for L. 50 or upwards, 1s.

Bank-BILL is a note or obligation signed on behalf of the company of the bank, by one of their cashiers, for value received. Or it is an obligation to pay on demand either to the bearer or to order; in Scotland, it is understood to be to order.

BILL of Entry, an account of the goods entered at the custom-house, both inwards and outwards. In this bill must be expressed, the merchant exporting or importing; the quantity of merchandize, and the divers species thereof; and whither transported, or from whence.

BILL of Exchange, is a security, originally invented among merchants in different countries, for the more easy remittance of money from the one to the other, which has since spread itself into almost all pecuniary transactions. It is an open letter of request from one man to another, desiring him to pay a sum named therein to a third person on his account; by which means a man at the most distant part of the world may have money remitted to him from any trading country. If A lives in Jamaica, and owes B who lives in England L. 1000; now if C be going from England to Jamaica, he may pay B this L. 1000 and take a bill of Exchange drawn by B in England upon A in Jamaica, and receive it when he comes thither. Thus does B receive his debt, at any distance of place, by transferring it to C; who carries over his money in paper-credit, without danger of robbery or loss. This method is said to have been brought into general use by the Jews and Lombards, when banished for their usury and other vices; in order the more easily to draw their effects out of France and England into those countries in which they had chosen to reside. But the invention of it was a little earlier; for the Jews were banished

out of Guienne in 1287, and out of England in 1290, and in 1236 the use of paper-credit was introduced into the Mogul empire in China.---In common speech, such a bill is frequently called a *draught*; but a bill of exchange is the more legal as well as mercantile expression. The person, however, who writes this letter is called, in law, the *drawer*; and he to whom it is written, the *drawee*; and the third person or negociator to whom it is payable (whether specially named or the bearer generally) is called the *payee*.

These bills are either foreign or inland; foreign, when drawn by a merchant residing abroad upon his correspondent in England, or *vice versa*; and inland, when both the drawer and the drawee reside within the kingdom. Formerly foreign bills of exchange were much more regarded in the eye of the law than inland ones, as being thought of more public concern in the advancement of trade and commerce. But now by two statutes, the one 9 and 10 W. III. c. 17. the other 3 and 4 Ann. c. 9. inland bills of exchange are put upon the same footing as foreign ones: what was the law and custom of merchants with regard to the one, and taken notice of merely as such, being by those statutes expressly enacted with regard to the other. So that there is now in law no manner of difference between them. In drawing foreign bills of exchange, it is customary to give two or three of the same date and tenor to be sent by different conveyances, that in case of accidents the person to whom they are sent may not be disappointed; in which case it is mentioned in the body of the bill, that is the 1st, 2d, or 3d bill of Exchange; so that when one is paid it discharges all the rest. Inland bills for any sum must be on 6d. stamped paper.

BILL of Lading, an acknowledgment signed by the master of a ship, and given to a merchant, &c. containing an account of the goods which the master has received on board from that merchant, &c. with a promise to deliver them at an intended place for a certain salary. Each bill of lading must be treble, one for the merchant who loads the goods, another to be sent to the person to whom they are consigned, and the third to remain in the hands of the master of the ship. It must be observed, however, that a bill of lading is used only when the goods sent on board a ship are but part of the cargo: for when a merchant loads a whole vessel for his own personal account, the deed passed between him and the master of the ship is called *charter-party*. See CHARTER-party.

BILLS of mortality, are accounts of the numbers of births and burials within a certain district, every week, month, quarter, or year. In this sense we say *weekly bills*, *monthly bills*, *quarterly bills*, *yearly bills*. The London *bills of mortality*, which were the first, are composed by the company of parish-clerks, and express the number of christenings of each sex, and the number of deaths from each disease.

BILL of Parcels, an account given by the seller to the buyer, containing the particulars of all the sorts and prices of the goods bought.

BILL of Sale, is when a person wanting a sum of money delivers goods as a security to the lender, to whom he gives this bill, empowering him to sell the goods, in case the sum borrowed is not repaid, with interest, at the appointed time.

Bill

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Bill.

BILL of Store, a licence granted at the custom-house to merchants, by which they have liberty to carry, custom-free, all such stores and provisions as they may have occasion for during their voyage.

BILL of Suffrance, a licence granted to a merchant, at the custom-house, suffering him to trade from one English port to another without paying custom.

Lombard BILLS, are instruments of an uncommon kind and figure, used in Italy and Flanders, and of late also in France; consisting of a piece of parchment, cut to an acute angle about an inch broad at top, and terminating in a point at bottom; chiefly given where private persons are concerned in the fitting out a ship on any long voyage. The manner is thus: The party, who is desirous to be concerned in the cargo or venture, carries his money to the merchant, who fits out the ship, where it is entered down in a register: at the same time the merchant writes down on a piece of parchment, upwards of an inch broad, and seven or eight inches long, the name of the lender and the sum lent; which being cut diagonal-wise, or from corner to corner, each party retains his half. On the return of the vessel, the lender brings his moiety to the merchant; which being compared with the other, he receives his dividend accordingly. Much the same is practised in Holland by those who lend money on pledges; the name of the borrower and the sum are written on a like slip of parchment, which is cut in two, and half given to the borrower, and the other half stitched to the pledge; that, upon comparing them together again, the borrower may receive his goods on paying the money stipulated.

BILL in Parliament, a paper containing propositions, offered to the houses to be passed by them, and then presented to the king to pass into a law.

To bring a bill into the house, if the relief sought by it is of a private nature, it is first necessary to prefer a petition; which must be presented by a member, and usually sets forth the grievance desired to be remedied. This petition (when founded on facts that may be in their nature disputed) is referred to a committee of members, who examine the matter alleged, and accordingly report it to the house; and then (or, otherwise, upon the mere petition) leave is given to bring in the bill. In public matters, the bill is brought in upon motion made to the house, without any petition at all. Formerly all bills were drawn in the form of petitions, which were entered upon the parliament-rolls, with the king's answer thereunto subjoined; not in any settled form of words, but as the circumstances of the case required; and at the end of each parliament the judges drew them into the form of a statute, which was entered on the statute-rolls. In the reign of Henry V. to prevent mistakes and abuses, the statutes were drawn up by the judges before the end of the parliament; and in the reign of Henry VI. bills in the form of acts, according to the modern custom, were first introduced.

The persons directed to bring in the bill, present it in a competent time to the house, drawn out on paper, with a multitude of blanks, or void spaces, where any thing occurs that is dubious, or necessary to be settled by the parliament itself (such especially as the precise date of times, the nature and quantity of penalties, or of any sums of money to be raised; being indeed

only the skeleton of the bill. In the house of lords, if the bill begins there, it is (when of a private nature) referred to two of the judges, who examine and report the state of the facts alleged, to see that all necessary parties consent, and to settle all points of technical propriety. This is read a first time, and at a convenient distance a second time; and after each reading, the speaker opens to the house the substance of the bill, and puts the question, Whether it shall proceed any farther? The introduction of the bill may be originally opposed, as the bill itself may at either of the readings; and, if the opposition succeeds, the bill must be dropped for that session; as it must also, if opposed with success in any of the subsequent stages.

After the second reading, it is committed; that is, referred to a committee: which is either selected by the house in matters of small importance; or else, upon a bill of consequence, the house resolves itself into a committee of the whole house. A committee of the whole house is composed of every member; and, to form it, the speaker quits the chair (another member being appointed chairman), and may sit and debate as a private member. In these committees the bill is debated clause by clause, amendments made, the blanks filled up, and sometimes the bill entirely new modelled. After it has gone through the committee, the chairman reports it to the house with such amendments as the committee have made; and then the house reconsiders the whole bill again, and the question is repeatedly put upon every clause and amendment. When the house hath agreed or disagreed to the amendments of the committee, and sometimes added new amendments of its own, the bill is then ordered to be engrossed, or written in a strong gross hand, on one or more long rolls (or presses) of parchment sewed together. When this is finished, it is read a third time, and amendments are sometimes then made to it; and if a new clause be added, it is done by tacking a separate piece of parchment on the bill, which is called a *ryder*. The speaker then again opens the contents; and, holding it up in his hands, puts the question, Whether the bill shall pass? If this is agreed to, the title to it is then settled; which used to be a general one for all the acts passed in the session, till in the fifth year of Hen. VIII. distinct titles were introduced for each chapter. After this, one of the members is directed to carry it to the lords and desire their concurrence; who, attended by several more, carries it to the bar of the house of peers, and there delivers it to their speaker, who comes down from his woollack to receive it.

It there passes through the same forms as in the other house (except engrossing, which is already done); and, if rejected, no more notice is taken, but it passes *sub silentio*, to prevent unbecoming altercations. But if it is agreed to, the lords send a message by two masters in chancery (or sometimes two of the judges) that they have agreed to the same: and the bill remains with the lords if they have made no amendment to it. But if any amendments are made, such amendments are sent down with the bill to receive the concurrence of the commons. If the commons disagree to the amendments, a conference usually follows between members deputed from each house; who for the most part settle and adjust the difference: but if both houses remain

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inflexible,

Bill.

Bill.

inflexible, the bill is dropped. If the commons agree to the amendments, the bill is sent back to the lords by one of the members, with a message to acquaint them therewith. The same forms are observed, *mutatis mutandis*, when the bill begins in the house of lords. But when an act of grace or pardon is passed, it is first signed by his majesty, and then read once only in each of the houses, without any new engrossing or amendment. And when both houses have done with any bill, it always is deposited in the house of peers, to wait the royal assent; except in the case of a bill of supply, which after receiving the concurrence of the lords is sent back to the house of commons.

The royal assent may be given two ways: 1. In person; when the king comes to the house of peers, in his crown and royal robes, and sending for the commons to the bar, the titles of all the bills that have passed both houses are read; and the king's answer is declared by the clerk of the parliament in Norman-French: a badge it must be owned (now the only one remaining), of conquest; and which one could wish to see fall into total oblivion; unless it be reserved as a solemn memento to remind us that our liberties are mortal, having been once destroyed by a foreign force. If the king consents to a public bill, the clerk usually declares, *Le roy le veut* "The king wills it so to be;" if to a private bill, *Soit fait come il est desire*, "Be it as it is desired." If the king refuses his assent, it is in the gentle language of *Le roy s'avisera*, "The king will advise upon it." When a bill of supply is passed, it is carried up and presented to the king by the speaker of the house of commons; and the royal assent is thus expressed, *Le roy remercie ses loyal subjects, accepte leur benevolence, et aussi le veut*; "The king thanks his loyal subjects, accepts their benevolence, and wills it so to be." In case of an act of grace, which originally proceeds from the crown and has the royal assent in the first stage of it, the clerk of the parliament thus pronounces the gratitude of the subject: *Les prelates, seigneurs, et commons, en ce present parliament assemblees, au nom de tous vous autres subjects, remercient tres humblement votre majesté, et prient a Dieu vous donner en sante bone vie et longue*; "The prelates, lords, and commons in this present parliament assembled, in the name of all your other subjects, most humbly thank your majesty, and pray to God to grant you in health and wealth long to live. 2. By the statute 33 Hen. VIII. c. 21. the king may give his assent by letters patent under his great seal, signed with his hand, and notified in his absence to both houses assembled together in the high house. And when the bill has received the royal assent in either of these ways, it is then, and not before, a statute or act of parliament.

This statute or act is placed among the records of the kingdom; there needing no formal promulgation to give it the force of a law, as was necessary by the civil law with regard to the emperor's edicts: because every man in Britain is, in judgment of law, party to the making of an edict of parliament, being present thereat by his representatives. However, a copy thereof is usually printed at the king's press for the information of the whole land. And formerly, before the invention of printing, it was used to be published by the sheriff of every county; the king's writ being sent to him at the end of every session, together with a tran-

script of all the acts made at that session, commanding him, *ut statuta illa, et omnes articulos in eisdem contentos, in singulis locis ubi expedire viderit, publice proclamari, et firmiter teneri et observari faciat*. And the usage was to proclaim them at his county court, and there to keep them, that whoever would, might read or take copies thereof; which custom continued till the reign of Henry VII.

An act of parliament thus made is the exercise of the highest authority that this kingdom acknowledges upon earth. It hath power to bind every subject in the land, and the dominions thereunto belonging; nay, even the king himself if particularly named therein. And it cannot be altered, amended, dispensed with, suspended, or repealed, but in the same forms and by the same authority of parliament: for it is a maxim in law, that it requires the same strength to dissolve as to create an obligation. It is true, it was formerly held, that the king might in many cases dispense with penal statutes; but now by statute 1 Wil. and M. ft. 2. c. 2. it is declared that the suspending or dispensing with laws by regal authority, without consent of parliament, is illegal.

BILL of Rights. See the article LIBERTY.

BILLERICAY, a town of Essex in England, seated on a hill, in E. Long. o. 25. N. Lat. 51. 35.

BILLET, in heraldry, a bearing in form of a long square. They are supposed to represent pieces of cloth of gold or silver; but Guillem thinks they represent a letter sealed up, and other authors take them for bricks. *Billeté* signifies that the escutcheon is all over strewn with billets, the number not ascertained.

BILLET-WOOD, small wood for fuel, cut three feet and four inches long, and seven inches and an half in compass; the affize of which is to be enquired of by justices.

BILLETING, in military affairs, is the quartering of soldiers in the houses of a town or village.—And, among fox-hunters, it signifies the ordure and dung of a fox.

BILLIARDS, an ingenious kind of game, played on a rectangular table, with little ivory balls, which are driven into hazards or holes, according to certain rules of the game.

This game was invented by the French, when it was played in a different manner from what it is at present, by having a pail or iron fixed on the table, through which the balls at particular periods of the game used to be played; but now this method is quite laid aside.

Soon after the French, the Germans, the Dutch, and Italians, brought this game into vogue throughout most parts of Europe, at which they became great proficient; and in a few years afterwards it became a favourite diversion in many parts of England, particularly with persons of the first rank. Since that time, indeed, it has been in a great measure prostituted by the designing and vulgar sort of people: notwithstanding, it will never be out of fashion, being of itself very entertaining, and attended with that kind of moderate exercise which renders it the more agreeable.

The table on which the game is played is generally about twelve feet long and six feet wide, or rather in the exact form of an oblong; it is covered with fine green cloth, and surrounded with cushions to prevent the balls rolling off, and to make them rebound.

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Billiards.

Billiards. There are six holes, nets, or pockets: these are fixed at the four corners, and in the middle, opposite to each other, to receive the balls, which when put into these holes or pockets are called hazards. The making of a hazard, that is, putting the adversary's ball in, at the usual game reckons for two in favour of the player.

The game is played with sticks, called *maces*, or with cues; the first consist of a long straight stick, with a head at the end, and are the most powerful instruments of the two: the cue is a thick stick diminishing gradually to a point of about half an inch diameter; this instrument is played over the left hand, and supported by the fore-finger and thumb. It is the only instrument in vogue abroad, and is played with amazing address by the Italians and some of the Dutch; but in England the mace is the prevailing instrument, which the foreigners hold in contempt, as it requires not near so much address to play the game with, as when the cue is made use of; but the mace is preferred for its peculiar advantage, which some professed players have artfully introduced, under the name of *trailing*, that is, following the ball with the mace to such a convenient distance from the other ball as to make it an easy hazard. The degrees of trailing are various, and undergo different denominations amongst the connoisseurs at this game; namely, the shove, the sweep, the long stroke, the trail, and the dead trail or turn up, all which secure an advantage to a good player according to their various gradations: even the butt end of the cue becomes very powerful, when it is made use of by a good trailer.

Rules generally observed at the common or usual game.

—1. For the lead, the balls must be put at one end, and the player must strike them against the farthest cushion, in order to see which will be nearest the cushion that is next to them. 2. The nearest to the cushion is to lead and choose the ball if he pleases. 3. The leader is to place his ball at the nail, and not to pass the middle pocket; and if he holes himself in leading, he loses the lead. 4. He who follows the leader must stand within the corner of the table, and not place his ball beyond the nail. 5. He who plays upon the running ball loses one. 6. He who touches the ball twice, and moves it, loses one. But these two rules are seldom or ever enforced, especially in England. 7. He who does not hit his adversary's ball, loses one. 8. He who touches both balls at the same time, makes a foul stroke, in which case if he should hole his adversary, nothing is gained by the stroke; but if he should put himself in, he loses two. 9. He who holes both balls, loses two. 10. He who strikes upon his adversary's ball, and holes himself, loses two. 11. He who plays at the ball without striking it, and holes himself, loses three. 12. He who strikes both balls over the table, loses two. 13. He who strikes his ball over the table, and does not hit his adversary's ball, loses three. 14. He who retains the end of his adversary's stick when playing, or endeavours to baulk his stroke, loses one. 15. He who plays another's ball or stroke without leave, loses one. 16. He who takes up his ball, or his adversary's without leave, loses one. 17. He who stops either ball when running loses one, and being near the hole loses two. 18. He who blows upon the ball when running loses one, and if near the hole loses two. 19. He who shakes the table when the

ball is running, loses one. 20. He who strikes the table with the stick, or plays before his turn, loses one. 21. He who throws the stick upon the table, and hits the ball, loses one. 22. If the ball stands upon the edge of the hole, and after being challenged it falls in, it is nothing, but must be put up where it was before. 23. If any person not being one of the players, stops a ball, the ball must stand in the place where it was stopped. 24. He who plays without a foot upon the floor and holes his adversary's ball, gets nothing for it, but loses the lead. 25. He who leaves the game before it is ended, loses it. 26. Any person may change his stick in play. 27. If any difference arise between players, he who marks the game or the majority of the company must decide it. 28. Those who do not play must stand from the table, and make room for the players. 29. If any person lays any wager, and does not play, he shall not give advice to the players upon the game.

Different kinds of games played at billiards.—Besides the common winning game, which is twelve up, there are several other kinds of games, viz. the losing-game, the winning and losing, choice of balls, bricole, carambole, Russian carambole, the bar-hole, the one-hole, the four-game, and hazards.

The *losing game*, is the common game nearly reversed; that is to say, except hitting the balls, which is absolutely necessary, the player gains by losing. By putting himself in, he wins two; by putting his adversary in, he loses two; but if he pockets both balls, he gets four. This game depends greatly upon particular strengths, and is therefore very necessary to be known to play the winning game well.

The *winning and losing game*, is a combination of both games; that is to say, all balls that are put in by striking first the adversary's ball, reckon towards game; and holing both balls reckons four. At this game and the losing, knocking over or forcing the balls over the cushion, goes for nothing, the striker only loses the lead.

Choice of balls, is choosing each time which ball the player pleases, which is doubtless a great advantage, and is generally played against losing and winning.

Bricole, is being obliged to hit a cushion, and make the ball rebound or return to hit the adversary's ball, otherwise the player loses a point. This is a great disadvantage, and is reckoned between even players to be equal to receiving about eight or nine points.

Carambole, is a game newly introduced from France. It is played with three balls, one being red, which is neutral, and is placed upon a spot on a line with the stringing nail (*i. e.* that part of the table from whence the player strikes his ball at first setting off, and which is generally marked with two brass nails). Each antagonist at the first stroke of a hazard, play from a mark which is upon a line with it at the other end of the table. The chief object at this game is, for the player to hit with his own ball the two other balls, which is called a *carambole*, and by which the player wins two. If he puts in the red ball he gets three, and when he holes his adversary's ball he gets two; so that seven may be made at one stroke, by caramboling and putting in both balls. This game resembles the losing, depending chiefly upon particular strengths, and is generally

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Billiards. nerally played with the cue. The game is sixteen up; nevertheless it is reckoned to be sooner over than the common game. The next object of this game, after making what we have distinguished by the *carambole*, is the *baulk*; that is, making the white ball, and bringing the player's own ball and the red one below the stringing nail, from whence the adversary's begin. By this means the opponent is obliged to play bricole from the opposite cushion; and it often happens that the game is determined by this situation.

The *Russian carambole*, is a game that has still more lately been introduced from abroad, and is played in the following manner: The red ball is placed as usual on the spot made for that purpose; but the player when he begins, or after having been holed, never places his ball on any particular place or spot; he being at liberty to put it where he pleases. When he begins to play, instead of striking at the red ball, he leads his own gently behind it, and his antagonist is to play at which he thinks proper: if he plays at the red ball and holes it, he scores three as usual towards the game, which is twenty-four instead of sixteen points; and the red ball is put upon the spot again, at which he may strike again or take his choice which of the two balls to push at, always following his stroke till both balls are off the table. He is intitled to two points each time that he caramboles, the same as at the other game; but if he caramboles and puts his own ball into any hole, he loses as many as he might have got had he not holed himself: for example, if he strikes at the red ball, which he holes, at the same time caramboles and holes himself, he loses five points; and if he holes both balls when he caramboles, and likewise his own, he loses seven, which he would have got if he had not holed his own ball. In other respects it is played like the common carambole game.

The *bar-hole*, is so called from the hole being barred which the ball should be played for, and the player striking for another hole; when this game is played against the common game, the advantage for the latter, between equal players, is reckoned to be about six.

The player at the *one-hole*, though it seems to those who are not judges of the game to be a great disadvantage, has in fact the best of it; for as all balls that go into the one hole reckon, the player endeavours to lay his ball constantly before that hole, and his antagonist frequently finds it very difficult to keep one or other ball out, particularly on the leads, when the one hole player lays his ball (which he does as often as he can) on the brink of the hole; leading for that purpose from the opposite end, which in reality he has no right to do; for the lead should be given from the end of the table at which the hazard is made; but when a person happens to be a novice, this advantage is often taken.

The *four-game*, consists of two partners on each side, at the common winning game; who play by succession after each hazard, or two points lost. The game is fifteen up; so that the point or hazard is an odd number, which makes a mis at this game of more consequence than it is at another; being as much at four, six, or eight, as it is at five, seven, or nine, at the single game.

Hazards, are so called because they depend entirely upon the making of hazards, there being no account kept of any game. Any number of persons may play

by having balls that are numbered; but the number seldom exceeds six, to avoid confusion. The person whose ball is put in, pays so much to the player according to what is agreed to be played for each hazard; and the person who misses, pays half the price of a hazard to him whose ball he played at. The only general rule is not to lay any ball a hazard for the next player, which may be in a great measure avoided, by always playing upon the next player, and either bringing him close to the cushion or putting him at a distance from the rest of the balls. The table, when hazards are played, is always paid for by the hour.

BILLINGHAM, a town of Northumberland in England, seated in W. Long. 1. 35. N. Lat. 55. 20.

BILLON, in the history of coins, a composition of precious and base metals, where the latter predominate. Wherefore gold under twelve carats fine, is called *billon of gold*; and silver under six penny-weight, *billon of silver*. So little attention was paid formerly to the purity of gold and silver, that the term *billon of gold* was applied only to that which was under twenty-one carats, and *billon of silver* to that which was lower than ten penny-weight.

BILLON, a town of Auvergne in France, situated in E. Long. 3. 30. N. Lat. 45. 36.

BILSDON, a small town of Leicestershire in England, situated in W. Long. 0. 15. N. Lat. 52. 40.

BILSEN, a town of Germany, in the circle of Westphalia and bishopric of Liege, seated on the river Demer, in E. Long. 5. 42. N. Lat. 50. 48.

BILSON (Thomas), bishop of Winchester, in which city he was born and educated. In 1565, he was admitted perpetual fellow of New college, and in 1570 completed his degrees in arts. He was made bachelor of divinity in 1579, and doctor the year following. His first preferment was that of master of Winchester school; he was next made prebendary, and afterwards warden, of Winchester college. In 1596 he was consecrated bishop of Worcester; and about a year after, translated to the see of Winchester, and sworn of queen Elizabeth's privy council. He was one of the principal managers of the Hampton-court conference in 1604; and the English translation of the Bible in the reign of king James I. was finally corrected by this prelate, and Dr Miles Smith bishop of Gloucester. He died in the year 1616; and was buried in Westminster abbey, near the entrance of St Edmund's chapel, on the south side of the monument of king Richard II. The several authors who have mentioned bishop Bilson, agree in giving him the character of a learned divine, an able civilian, and an upright man. His style is in general much more easy and harmonious than that of cotemporary ecclesiastics. His works are, 1. *Several Latin poems and orations*. Manuscript, in Ant. Wood's library. 2. *The true difference between Christian subjection and unchristian rebellion*. Oxf. 1585, 4to. Lond. 1586, 8vo. 3. *The perpetual government of Christ's church*. Lond. 1593, 4to, Black Letter. 4. *The effect of certain sermons touching the full redemption of mankind by the death and blood of Christ, &c.* Lond. 1599, 4to. 5. *The survey of Christ's suffering for man's redemption, and of his descent to Hades or Hell*. Lond. 1604, fol. 6. *A sermon preached before king James I. and his queen at their coronation*. Lond. 1603, 8vo.

BIMEDIAL,

Billingham
||
Bilson.

Bimedial
||
Binary.

BIMEDIAL, in mathematics. If two medial lines, as AB and BC, commensurable only in power, containing a rational rectangle, are compounded, the whole line AC will be irrational, and is called a *first bimedral line*.

B
A ———— + ———— C

See Euclid, lib. x. prop. 38.

BIMINI, one of the Lucaya islands in North America, near the channel of Bahama. It is about eight miles in length, and as much in breadth, covered with trees, and inhabited by the native Americans. It is very difficult of access on account of the shoals, but is a very pleasant place. W. Long. 79. 30. N. Lat. 25. 0.

BIMLIPATAN, a sea-port town of Golconda in the East Indies, seated on the west side of the bay of Bengal. Here the Dutch have a very small factory, designed for buying up the cloth manufactured by the inhabitants. E. Long. 83. 5. N. Lat. 18. 0.

BINACLE, a wooden case or box, which contains the compasses, log-glasses, watch-glasses, and lights to show the compass at night. As this is called *bittacle* in all the old sea-books, even by mariners, it appears evidently to be derived from the French term *habittacle* (a small habitation), which is now used for the same purpose by the seamen of that nation. The binacle (Plate XCV. fig. 4.) is furnished with three apartments, with sliding shutters: the two side ones, *a b*, have always a compass in each *d*, to direct the ship's way; while the middle division, *c*, has a lamp or candle with a pane of glass on either side to throw a light upon the compass in the night, whereby the man who steers may observe it in the darkest weather, as it stands immediately before the helm on the quarter deck. There are always two binnacles on the deck of a ship of war, one being designed for the man who steers, and the other for the person who superintends the steerage, whose office is called *conning*.

BINAROS, a small town of Spain, in the kingdom of Valentia, remarkable for good wine. It is seated near the sea, in E. Long. 0. 15. N. Lat. 40. 24.

BINARY ARITHMETIC, that wherein unity or 1 and 0 are only used. This was the invention of M. Leibnitz, who shows it to be very expeditious in discovering the properties of numbers, and in constructing tables: and Mr Dangecourt, in the history of the royal academy of sciences, gives a specimen of it concerning arithmetical progressions; where he shows, that because in binary arithmetic only two characters are used, therefore the laws of progression may be more easily discovered by it than by common arithmetic. All the characters used in binary arithmetic are 0 and 1; and the cypher multiplies every thing by 2, as in the common arithmetic by 10. Thus 1 is one; 10, two; 11, three; 100, four; 101, five; 110, six; 111, seven; 1000, eight; 1001, nine; 1010, ten; which is built on the same principles with common arithmetic. Hence immediately appears the reason of the celebrated property of the duplicate geometrical proportion in whole numbers; viz. that one number of each degree being had, we may thence compose all the other whole numbers above the double of the highest degree. It being here, v. gr. as if one should say,

111 is the sum of 4, 2, and 1, which property may serve essayers to weigh all kinds of masses with a little weight; and may be used in coins, to give several values with small pieces. This method of expressing numbers once established, all the operations will be easy: in multiplication particularly, there will be no need for a table, or getting any thing by heart. The author, however, does not recommend this method for common use, because of the great number of figures required to express a number; adding, that if the common progression were from 12 to 12, or from 16 to 16, it would be still more expeditious; but its use is in discovering the properties of numbers, in constructing tables, &c. What makes the binary arithmetic the more remarkable is, that it appears to have been the same with that used 4000 years ago among the Chinese, and left in *enigma* by Fohi, the founder of their empire, as well as of their sciences.

BINARY Measure, in music, is a measure which is beaten equally, or where the time of rising is equal to that of falling. This is usually called *common time*.

BINARY Number, that composed of two units.

BINCH, a small fortified town of the Low Countries, in the county of Hainault, subject to the house of Austria. E. Long. 3. 21. N. Lat. 50. 23.

BIND, a country word for a stalk of hops.

BIND of Eels, a quantity, consisting of 250, or 10 strikes, each containing 25 eels.

BIND-WEED, in botany. See CONVULVULIS.

BINDBROKE, a town of Lincolnshire in England, seated in E. Long. 0. 10. N. Lat. 53. 32.

BINDING-JOISTS, in architecture, are those joists in a floor, into which the trimmers of stair-cases, or well-holes of the stairs, and chimney-ways, are framed: they ought to be stronger than common joists.

BINDING, in the art of defence, a method of securing or crossing the adversary's sword with a pressure, accompanied with a spring from the wrist. See BEATING.

Unless a man by some kind of cross, secure, as it were, or render his adversary's sword incapable to offend him during the time of his performing a lesson upon him, it is impossible for him to be certain but that he may receive from his adversary, either a fortuitous *contretemps*, or an exchanged thrust, before the recovery of his body, or going off after a thrust.—The great objection made by some people, particularly those time-catchers, against the frequent use of binding, is, that when a man, in performing it, cleaves too much to his adversary's sword, he is liable to his adversary's slipping of him, and consequently of receiving either a plain thrust, or one from a feint.

BINDING is a term in falconry, which implies tiring, or when a hawk seizes.

BINDING of Books. See BOOK-BINDING.

BING, in the alum-works, denotes a heap of alum thrown together in order to drain.

BINGAZI, a sea-port town of Africa, in the kingdom of Tripoli. E. Long. 19. 10. N. Lat. 32. 20.

BINGEN, an ancient and handsome town of Germany, in the archbishopric of Mentz, seated at the place where the river Nave falls into the Rhine. E. Long. 7. 48. N. Lat. 50. 3.

BINGHAM

Binary
||
Bingen.

100	4
10	2
1	1
—	—
111	7

Bingham

Bion.

BINGHAM (Joseph), a learned divine, born at Wakefield in Yorkshire, in September 1668, educated at University college in Oxford, and afterwards presented by John Radcliffe, M. D. to the rectory of Headbournworthy, near Winchester. In this country retirement he began his learned and laborious work, *Origines Ecclesiasticae*; or, The Antiquities of the Christian church. The first volume of which was published in 1708, and it was completed afterwards in nine volumes more. He published also several other books. But notwithstanding his great learning and merit, he had no other preferment than that of Headbournworthy till the year 1712, when he was collated to the rectory of Havant, near Portsmouth, by Sir Jonathan Trelawney bishop of Winchester, to whom he dedicated several of his books. He died August 17th, 1723, in the 55th year of his age.

BINGHAM, a town of Nottinghamshire in England, seated in the vale of Belvoir, in W. Long. 1. 10. N. Lat. 50. 3.

BINGIUM, (anc. geog.), a village or town of the Vangiones in Gallicia Belgica, seated at the confluence of the Nave and Rhine. Now **BINGEN**, which see.

BINGLEY, a town in the west riding of Yorkshire, seated on the river Aire, in W. Long. 1. 35. N. Lat. 53. 20.

BINN, *binna*, a sort of chest or cupboard, wherein to lock up bread, meat, or other provisions. The word is also used for a place boarded up to put corn in.

BINN, or **BIN**. The pease and oatmeal, used at sea, are apt to spoil in casks. Dr Hales proposes to prevent this, by putting them into large binns, with false bottoms of hair cloths laid on bars, whereby fresh air may be blown upwards through them, at proper times, with small ventilators.

BINOCULAR TELESCOPE, a kind of dioptric telescope fitted with two tubes, joined in such a manner that one may see a distant object with both eyes at the same time. See **OPTICS**.

BINOMIAL, in algebra, a root consisting of two members connected by the sign + or -. Thus $a+b$, and $8-3$, are binomials, consisting of the sums and differences of these quantities. See **ALGEBRA**.

BINTAN, an island of Asia, in the East Indies, to the south of the peninsula of Malacca, situated in E. Long. 103. 50. N. Lat. 1. 0.

BIOGRAPHER, one who writes the lives of particular persons, as Plutarch, Suetonius, &c. See the next article.

BIOGRAPHY, a species of history which records the lives and characters of remarkable persons. This is at once the most entertaining and instructive kind of history. It admits of all the painting and passion of romance; but with this capital difference, that our passions are more keenly interested, because the characters and incidents are not only agreeable to nature, but strictly true. No books are so proper to be put into the hands of young people. See the *Preface* to this **WORK**; and **HISTORY**, n^o 85.

BION, a bucolic poet, native of Smyrna, lived at the same time with Ptolemy Philadelphus, whose reign reached from the fourth year of the 123d Olympiad to the second year of the 133d. He was an incomparable poet, if we may believe the lamentations of his disciple

Mosehus. His few pieces which are left do not contradict this testimony. See **MOSCHUS**.

BION, surnamed *Boryllhenites*, because he was of Boryllhenes, was a philosopher of a great deal of wit, but of very little religion: he flourished about the 120th Olympiad; but falling sick, he, like other profane persons, became superstitious.

BIORNBURG, a town of north Finland in Sweden, seated on the river Kune near its mouth in the Gulf of Bothnia. E. Long. 22. 35. N. Lat. 62. 6.

BIOTHANATI (from *βία*, violence, and *θάνατος*, death), in some medical writers, denotes those who die a violent death. The word is also written, and with more propriety, *biathanati*; sometimes *biaothanti*.

In a more particular sense, it denotes those who kill themselves, more properly called *autothanati*. In this sense it is that the word is used both by Greek and Latin writers. By the ancient discipline of the church, they were punished by denying them burial, and refusing all commemoration of them in the prayers and offices of the church.

BIOTHANATI (supposed by some to be derived from *βίος*, life, and *θάνατος*, death, and alluding to the belief of a future life after death), was also a name of reproach given by the Heathens to the primitive Christians, for their constancy and forwardness to lay down their lives in martyrdom.

BIOTHANATOS is also used in some writers of the barbarous age for wicked, damnable, or accursed.

BIOUAC, **BIVOUAC**, or **BIOVAC**, in the military art, a nightly guard performed by the whole army, when there is an apprehension of danger from the enemy. The word is formed by corruption from the German *weydwacht*, a double watch or guard.

BIPENNIS, a two-edged axe, used anciently by the Amazons in fight; as also by the seamen, to cut asunder the ropes and cordage of the enemy's vessels. The bipennis was a weapon chiefly of the oriental nations, made like a double axe, or two axes joined back to back, with a short handle. Modern writers usually compare it to our halbard or partizan; from which it differed in that it had no point, or that its shaft or handle was much shorter.

BIQUADRATE, or **BIQUADRATIC**, is the next power above the cube, or the square multiplied by itself.

BIQUADRATIC EQUATION, in algebra, an equation raised to the fourth power, or where the unknown quantity of one of the terms has four dimensions: Thus $x^4 + ax^3 + bx^2 + cx + d = 0$ is a biquadratic equation. See **ALGEBRA**.

BIQUADRATIC Parabola, in geometry, a curve line of the third order, having two infinite legs tending the same way. See **PARABOLA**.

BIQUADRATIC Power of any number, is the fourth power or squared square of that number: Thus 16 is the biquadratic power of 2; for $2 \times 2 = 4$, and $4 \times 4 = 16$.

BIQUADRATIC Root of any number, is the square root of the square root of that number: Thus the biquadratic root of 81 is 3; for the square root of 81 is 9, and the square root of 9 is 3.

BIQUALAR, in the customs of the Algerines, a cock of the divan.---The janizaries, whom the Algerines call *oldachis*, after serving a certain term as common

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Biquintile mon soldiers, are preferred to be bigualars, or cooks of the divan, which is the first step towards arriving at higher preferment. Bigualars have the care of furnishing the officers and commanders of the Algerine soldiery with meat and drink in the camp, in garrison, &c. From bigualars they are made odobachis; that is, corporals of companies, or commanders of squadrons.

BIQUINTILE, an aspect of the planets, when they are 144 degrees distant from each other. It is thus called, because they are distant from one another by twice the fifth part of 360 degrees.

BIR, or **BERR**, a town of the province of Diarbeck in Turkey in Asia, with a castle where the governor resides, seated on the eastern bank of the river Euphrates, near a high mountain in a very pleasant and fertile country. E. Long. 38. 6. N. Lat. 36. 10.

BIRAGUE (Clement), a Milanese engraver, and the inventor of the art of cutting diamonds, flourished about the year 1580.

BIRCH-TREE, in botany. See **BETULA**.

BIRCH-Bark, being bituminous, and consequently warm and emollient, is used in fumigations to correct a distempered air. The inner silken bark was anciently used for writing-tables before the invention of paper; though Ray rather assigns the office of paper to the cuticle, or outer skin, which peels off yearly. And with the outward, thicker, and coarser part, are houses in Russia, Poland, and other northern tracts, covered, instead of slates and tyle. The Indians make pinnaces with white cedar, which they cover with large flakes of birch-bark; sewing them with thread of spruce-roots, and pitching them, as the ancient Britons did, with the willow. Pliny speaks of a bitumen actually procured from the birch-tree.

Fungus of BIRCH, an excrescence growing on its trunk. It is astringent, and good against hemorrhagies. When boiled, beaten, and dried in an oven, it makes excellent spunk or touchwood.

BIRCH-Leaves are of use in the dropsy, itch, &c. either internally or externally applied.

BIRCH-Twigs serve to make rods and brooms: smeared with bird-lime, they are used by fowlers; to say nothing of the ancient fasces carried by lictors.

BIRCH-Wine is made by fermenting the vernal juice. Formerly it was in great repute against all nephritic disorders, but is left out in the modern London practice. The preparation of birch-wine is well and amply described in a book intitled *Vinetum Britannicum*.

BIRCH (Dr Thomas), an eminent historical and biographical writer, was born in London in 1705. His parents were both of them Quakers; and his father, Joseph Birch, was a coffee-mill maker by trade. Thomas being put to school, was indefatigable in his application, and stole many hours from sleep to increase his stock of knowledge. By this unremitting diligence, though he had not the happiness of an university education, he soon became qualified to take holy orders in the church of England, to the surprise of his acquaintance. In 1728 he married the daughter of the Rev. Mr Cox, to whom he was curate: but his felicity was of short duration, Mrs Birch dying of a puerperal fever in less than 12 months after their marriage; an event which he deploras in a very elegant and pathetic poem, preserved in Nichols's

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Collection. In 1732 he was recommended to the friendship and favour of the late lord high chancellor Hardwicke, then attorney-general; to which noble peer, and to the present Earl of Hardwicke, he was indebted for all his preferments. The first proof he experienced of his patron's regard was the living of Ulting in the county of Essex, in the gift of the crown, to which he was presented 1732. In 1734 he was appointed one of the domestic chaplains to the unfortunate Earl of Kilmarnock, who was beheaded 1746. Mr Birch was chosen a member of the Royal Society, Feb. 20. 1734-5; and of the Society of Antiquaries, Dec. 11. 1735, of which he afterwards became director till his death. Before this, the Marischal college of Aberdeen had conferred on him, by diploma, the degree of Master of Arts. In 1743, by the interest of Lord Hardwicke, he was presented by the crown to the sinecure rectory of Landewy Welfrey in the county of Pembroke; and in 1743-4 was preferred, in the same manner, to the rectory of Sidington in St Peter's, in the county and diocese of Gloucester. We find no traces of his having taken possession of this living; and indeed it is probable that he quitted it immediately for one more suitable to his inclinations and to his literary engagements, which required his almost constant residence in town; for on the 24th of February 1743-4, he was instituted to the united rectories of St Michael Woodstreet, and St Mary Staining; and in 1745-6, to the united rectories of St Margaret Pattens and St Gabriel, Fenchurchstreet (by lord chancellor Hardwicke, in whose turn the presentation then was). In January 1752, he was elected one of the secretaries of the Royal Society, in the room of Dr Cromwell Mortimer, deceased. In January 1753, the Marischal college of Aberdeen created him Doctor of Divinity; and in that year the same degree was conferred on him by Archbishop Herring. He was one of the trustees of the British Museum; for which honour he was probably indebted to the present Earl of Hardwicke, as he was for his last preferment, the rectory of Depden in Essex, to which he was inducted Feb. 26. 1761. In the latter part of his life he was chaplain to the Princess Amelia. In 1765 he resigned his office of secretary to the Royal Society, and was succeeded by Dr Morton. His health declining about this time, he was ordered to ride for the recovery of it; but being a bad horseman, and going out Jan. 9. 1766, he was unfortunately thrown from his horse, on the road betwixt London and Hampstead, and died on the spot, in the 61st year of his age, to the great regret of the Doctor's numerous literary friends; and was buried in St Margaret Pattens. Dr Birch had in his lifetime been very generous to his relations; and none that were nearly allied to him being living at his decease, he bequeathed his library of books and manuscripts, with his picture painted in 1735, and all his other pictures and prints not otherwise disposed of by his will, to the British Museum. He likewise left the remainder of his fortune, which amounted to not much more than 500 l. to be laid out in government-securities, for the purpose of applying the interest to increase the stipend of the three assistant librarians: thus manifesting at his death, as he hath done during his whole life, his respect for literature, and his desire to promote useful knowledge.

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ledge. To the Royal Society he bequeathed his picture painted by Wills in 1737, being the original of the mezzotinto print done by Fauber in 1741. His principal publications were, 1. "The General Dictionary, Historical and Critical; including a new translation of Mr Bayle, and interspersed with several thousand new lives. Dr Birch's associates in this undertaking were, the Rev. John Peter Bernard, Mr John Lockman, and Mr George Sale. The whole design was completed in 10 volumes folio. 2. Dr Cudworth's "Intellectual System (improved from the Latin edition of Mosheim), his Discourse on the true Notion of the Lord's Supper, and two Sermons, with an account of his Life and Writings," 2 vols 4to, 1743. 3. "The Life of the Hon. Robert Boyle," 1744; prefixed to an edition of that excellent philosopher's works, revised by Dr Birch. 4. "The Lives of Illustrious Persons of Great Britain," annexed to the engravings of Houbraken and Vertue, 1747—1752. 5. "An Inquiry into the Share which King Charles I. had in the Transactions of the Earl of Glamorgan," 1747, 8vo. 6. An edition of "Spenser's Fairy Queen, 1751," 3 vols quarto, with prints from designs by Kent. 7. "The Miscellaneous Works of Sir Walter Raleigh;" to which was prefixed the Life of that great, unfortunate, and injured man, 1751, 2 vols 8vo. 8. "The Theological, Moral, Dramatic, and Poetical Works of Mrs Catharine Cockburn; with an Account of the Life of that very ingenious Lady," 1751, 2 vols 8vo. 9. "The Life of the Most Reverend Dr John Tillotson, Lord Archbishop of Canterbury. Compiled chiefly from his original Papers and Letters," 1752, 8vo. 10. "Milton's Prose Works," 1753, 2 vols 4to; with a new Life of that great poet and writer. 11. "Memoirs of the Reign of Queen Elizabeth, from the year 1581 till her death. In which the secret intrigues of her court, and the conduct of her favourite Robert Earl of Essex, both at home and abroad, are particularly illustrated. From the original papers of his intimate friend Anthony Bacon, Esq; and other manuscripts never before published," 1754, 2 vols 4to. 12. "The History of the Royal Society of London for improving natural knowledge, from its first rise. In which the most considerable of those papers communicated to the Society, which have hitherto not been published, are inserted in their proper order, as a supplement to the Philosophical Transactions." 1756 and 1757, 4 vols 4to. 13. "The Life of Henry Prince of Wales, eldest Son of King James I. Compiled chiefly from his own papers and other manuscripts, never before published," 1760, 8vo. His numerous communications to the Royal Society may be seen in the Philosophical Transactions; and his poetical talents are evident from the verses already referred to.

BIRD (William), an eminent musician and composer, was one of the children of the chapel in the reign of Edward VI. and, as it is asserted by Wood in the Ashmolean MS. was bred up under Tallis. It appears, that in 1575 Tallis and Bird were both gentlemen and also organists of the royal chapel; but the time of their appointment to this latter office cannot now be ascertained.

The compositions of Bird are many and various; those of his younger years were mostly for the service

of the church. He composed a work entitled *Sacrarum Cantionum, quinque vocum*, printed in 1589; among which is that noble composition *Civitas sancti tui*, which for many years past has been sung in the church as an anthem to the words "Bow thine ear, O Lord." He was also the author of a work entitled *Gradualia, ac Cantiones sacre, quinis, quaternis, trinisque vocibus concinnata. lib. primus*. Of this there are two editions, the latter published in 1610. Although it appears by these his works that Bird was in the strictest sense a church musician, he occasionally gave to the world compositions of a secular kind: and he seems to be the first among English musicians that ever made an essay in the composition of that elegant species of vocal harmony, the madrigal; the *La Verginella* of Ariosto, which he set in that form for five voices, being the most ancient musical composition of the kind to be met with in the works of English authors. Of his compositions for private entertainment, there are extant, 'Songs of sundry natures, some of gravitie, and others of myrth, fit for all companies and voyces, printed in 1589;' and two other collections of the same kind, the last of them printed in 1611. But the most permanent memorials of Bird's excellencies are his motets and anthems; to which may be added, a fine service in the key of D with the minor third, the first composition in Dr Boyce's Cathedral Music, vol. III. and that well-known canon of his, *Non nobis Domine*.

Besides his salaries and other emoluments of his profession, it is to be supposed that Bird derived some advantages from the patent granted by queen Elizabeth to Tallis and him, for the sole printing of music and music-paper: Dr Ward speaks of a book which he had seen with the letters T. E. for Thomas East, Est, or Este, who printed music under that patent. Tallis dying in 1585, the patent, by the terms of it, survived to Bird, who, no doubt for a valuable consideration, permitted East to exercise the right of printing under the protection of it; and he in the title-page of most of his publications styles himself the *assignee of William Byrd*. Bird died in 1623.

BIRD, in zoology. See ZOOLOGY, n° 8.; COMPARATIVE-ANATOMY, chap. ii.; and ORNITHOLOGY.

Beam-BIRD, or Petty-chaps. See MOTACILLA.

Black-BIRD.

Blue-BIRD.

Call-BIRD.

Canary-BIRD.

Dung-BIRD.

Humming-BIRD.

Mocking-BIRD.

BIRD of Paradise.

BIRD-Call, a little stick cleft at one end, in which is put a leaf of some plant, wherewith to counterfeit the cryer's call of several birds, and bring them to the net, or snare, or lime-twigg, to be taken. A laurel-leaf fitted on the bird-call, counterfeits the voice of lapwings; a leek that of nightingales, &c.

BIRD-Catching, the art of taking birds or wild-fowl, whether for food, for the pleasure of their song, or for their destruction as pernicious to the husbandman, &c. The methods are by bird-lime, nets, decoys, &c. See BIRD-Lime, infra; and DECOY.

In the suburbs of London (and particularly about Shoreditch) are several weavers and other tradesmen, who,

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who, during the months of October and March, get their livelihood by an ingenious, and, we may say, a scientific, method of *bird-catching*, which is totally unknown in other parts of Great Britain. The reason of this trade being confined to so small a compass, arises from their being no considerable sale for singing-birds except in the metropolis: as the apparatus for this purpose is also heavy, and at the same time must be carried on a man's back, it prevents the bird-catchers going to above three or four miles distance.

This method of bird-catching must have been long practised, as it is brought to a most systematical perfection, and is attended with a very considerable expence.

The nets are a most ingenious piece of mechanism; are generally twelve yards and a half long, and two yards and a half wide; and no one, on bare inspection, would imagine that a bird (who is so very quick in all its motions) could be caught by the nets flapping over each other, till he becomes eye-witness of the pullers seldom failing.

The wild birds *fly* (as the bird-catchers term it) chiefly during the month of October, and part of September and November; as the flight in March is much less considerable than that of Michaelmas. It is to be noted also, that the several species of birds of *flight* do not make their appearance precisely at the same time, during the months of September, October, and November. The pipet (A), for example, begins to fly about Michaelmas; and then the woodlark, linnets, goldfinch, chaffinch, greenfinch, and other birds of flight succeed; all of which are not easily to be caught, or in any numbers, at any other time, and more particularly the pipet and the woodlark.

These birds, during the Michaelmas and March flights, are chiefly on the wing from day-break to noon, though there is afterwards a small flight from two till night; but this however is so inconsiderable, that the bird-catchers always take up their nets at noon.

It may well deserve the attention of the naturalist whence these periodical flights of certain birds can arise. As the ground, however, is ploughed during the months of October and March for sowing the winter and lent corn, it should seem that they are thus supplied with a great profusion both of seeds and insects, which they cannot so easily procure at any other season.

It may not be improper to mention another circumstance, to be observed during their flitting, viz. that they fly always against the wind: hence there is great contention amongst the bird-catchers who shall gain that point; if (for example) it is westerly, the bird-catcher who lays his nets most to the east, is sure almost of catching every thing, provided his call-birds

are good: a gentle wind to the south-west generally produces the best sport.

The bird-catcher, who is a substantial man, and hath a proper apparatus for this purpose, generally carries with him five or six linnets, (of which more are caught than any singing bird), two gold-finches, two green-finches, one wood-lark, one red-poll, a yellow-hammer, tit-lark, and aberdavine, and perhaps a bullfinch; these are placed at small distances from the nets in little cages. He hath, besides, what are called *flur-birds*, which are placed within the nets, are raised upon the flur (B), and gently let down at the time the wild bird approaches them. These generally consist of the linnets, the gold-finch, and the green-finch, which are secured to the flur by what is called a *brace* (C); a contrivance that secures the birds without doing any injury to their plumage.

It having been found that there is a superiority between bird and bird, from the one being more in song than the other; the bird-catchers contrive that their call-birds should moult before the usual time. They therefore, in June or July, put them into a close box under two or three folds of blankets, and leave their dung in the cage to raise a greater heat; in which state they continue, being perhaps examined but once a-week to have fresh water. As for food, the air is so putrid, that they eat little during the whole state of confinement, which lasts about a month. The birds frequently die under the operation; and hence the value of a stopped bird rises greatly. When the bird hath thus prematurely moulted, he is in song whilst the wild birds are out of song, and his note is louder and more piercing than that of a wild one; but it is not only in his note he receives an alteration, the plumage is equally improved. The black and yellow in the wings of the gold-finch, for example, become deeper and more vivid, together with a most beautiful gloss, which is not to be seen in the wild bird. The bill, which in the latter is likewise black at the end, in the stopped-bird becomes white and more taper, as do its legs: in short, there is as much difference between a wild and a stopped-bird, as there is between a horse which is kept in body-clothes and one at grass.

When the bird-catcher hath laid his nets, he disposes of his call-birds at proper intervals. It must be owned, that there is most malicious joy in these call-birds to bring the wild ones into the same state of captivity; which may likewise be observed with regard to the decoy ducks. See DECOY.

Their sight and hearing infinitely excels that of the bird-catcher. The instant that the (D) wild birds are perceived, notice is given by one to the rest of the call-birds, (as it is by the first hound that hits on the scent to the rest of the pack); after which, follows the same sort of tumultuous ecstacy and joy. The call-birds,

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while

(A) A small species of lark, but which is inferior to other birds of that genus in point of song.

(B) A moveable perch to which the bird is tied, and which the bird-catcher can raise at pleasure by means of a long string fastened to it.

(C) A sort of bandage, formed of a slender filken string that is fastened round the bird's body, and under the wings, in so artful a manner as to hinder the bird from being hurt, let it flutter ever so much in the raising.

(D) I may be also observed, that the moment they see a hawk, they communicate the alarm to each other by a plaintive note; nor will they then jerk or call though the wild birds are near.

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while the bird is at a distance, do not sing as a bird does in a chamber; they invite the wild ones by what the bird-catchers call *short jerks*, which, when the birds are good, may be heard at a great distance. The ascendancy by this call or invitation is so great, that the wild bird is stopped in its course of flight; and, if not already acquainted with the nets (E), lights boldly within 20 yards of perhaps three or four bird-catchers, on a spot which otherwise it would not have taken the least notice of. Nay, it frequently happens, that if half a flock only are caught, the remaining half will immediately afterwards light in the nets, and share the same fate; and should only one bird escape, that bird will suffer itself to be pulled at till it is caught; such a fascinating power have the call-birds.

While we are on this subject of the jerking of birds, we cannot omit mentioning, that the bird-catchers frequently lay considerable wagers whose call-bird can jerk the longest, as that determines the superiority. They place them opposite to each other, by an inch of candle; and the bird who jerks the oftenest, before the candle is burnt out, wins the wager. We have been informed, that there have been instances of a bird's giving 170 jerks in a quarter of an hour; and we have known a linnet, in such a trial, persevere in its emulation till it swooned from the perch: thus, as Pliny says of the nightingale, *visâ morte finit sepe vitam, spiritu prius deficiente quam cantu*†. It may be here observed, that birds when near each other, and in sight, seldom jerk or sing. They either fight, or use short and wheeling calls; the jerking of these call-birds, therefore, face to face, is a most extraordinary instance of contention for superiority in song.

To these we may add a few particulars that fall within our notice during our inquiries among the bird-catchers; such as, that they immediately kill the hens of every species of birds they take, being incapable of singing, as also being inferior in plumage; the pippets likewise are indiscriminately destroyed, as the cock does not sing well: they sell the dead birds for three-pence or four-pence a dozen. These small birds are so good, that we are surprised the luxury of the age neglects so delicate an acquisition to the table. The modern Italians are fond of small birds, which they eat under the common name of *beccaficos*: and the dear rate a Roman tragedian paid for one dish of singing birds is well known; (see the article *ÆSOP*).

Another particular we learned, in conversation with a London bird-catcher, was the vast price that is sometimes given for a single song-bird, which had not learned to whistle tunes. The greatest sum we heard of, was five guineas for a chaffinch, that had a particular and uncommon note, under which it was intended to train others: and we also heard of five pounds ten shillings being given for a call-bird linnet.

A third singular circumstance, which confirms an observation of Linnæus, is, that the male chaffinches fly by themselves, and in the flight precede the females; but this is not peculiar to the chaffinches. When the tit-larks are caught in the beginning of the season, it frequently happens, that forty are taken and not one

female among them: and probably the same would be observed with regard to other birds (as has been done with relation to the wheat-ear), if they were attended to. An experienced and intelligent bird-catcher informed us, that such birds as breed twice a year, generally have in their first brood a majority of males, and in their second, of females, which may in part account for the above observation.

We must not omit mention of the bullfinch, though it does not properly come under the title of a singing bird, or a bird of flight, as it does not often move farther than from hedge to hedge; yet, as the bird sells well on account of its learning to whistle tunes, and sometimes flies over the fields where the nets are laid, the bird-catchers have often a call-bird to ensnare it, though most of them can imitate the call with their mouths. It is remarkable with regard to this bird, that the female answers the purpose of a call bird as well as the male, which is not experienced in any other bird taken by the London bird-catchers.

The nightingale is not a bird of flight, in the sense the bird-catchers use this term. Like the robin, wren, and many other singing birds, it only moves from hedge to hedge, and does not take the periodical flights in October and March. The persons who catch these birds, make use of small trap-nets, without call-birds; and are considered as inferior in dignity to other bird-catchers who will not rank with them. The arrival of the nightingale is expected by the trappers in the neighbourhood of London, the first week in April: at the beginning, none but cocks are taken; but in a few days the hens make their appearance, generally by themselves, though sometimes a few males come along with them. The latter are distinguished from the females not only by their superior size, but by a great swelling of their vent, which commences on the first arrival of the hens. They are caught in a net-trap, the bottom of which is surrounded with an iron ring; the net itself is rather larger than a cabbage net. When the trappers hear or see them, they strew some fresh mould under the place, and bait the trap with a meal-worm from the baker's shop. Ten or a dozen nightingales have been thus caught in a day.

The common way of taking larks, of which so many are used at our tables (see *ALAUDA*), is in the night, with those nets which are called *trammels*. These are usually made of 36 yards in length, and about six yards over, with six ribs of pack-thread, which at the ends are put upon two poles of about 16 feet long, and made lesser at each end. These are to be drawn over the ground by two men, and every five or six steps the net is made to touch the ground, otherwise it will pass over the birds without touching them, and they will escape. When they are felt to fly up against the net, it is clapped down, and then all are safe that are under it. The darkest nights are properest for this sport; and the net will not only take larks, but all other birds that roost on the ground; among which are wookcocks, snipes, partridge, quails, field-fares, and several others. In the depth of winter people sometimes take great numbers of larks by nooses of horse-hair. The method

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(E) A bird, acquainted with the nets, is by the bird-catchers termed a *sharper*; which they endeavour to drive away, as they can have no sport whilst it continues near them.

Birds

is this: Take 100 or 200 yards of packthread; fasten at every six inches a noose made of double horse-hair; at every 20 yards the line is to be pegged down to the ground, and so left ready to take them. The time to use this is when the ground is covered with snow, and the larks are to be allured to it by some white oats scattered all the way among the nooses. They must be taken away as soon as three or four are hung, otherwise the rest will be frightened; but though the others are scared away just where the sportsman comes, they will be feeding at the other end of the line, and the sport may be thus continued for a long time. Those caught in the day are taken in clap-nets of fifteen yards length, and two and a half in breadth; and are enticed within the reach by means of bits of looking-glass, fixed in a piece of wood, and placed in the middle of the nets, which are put in a quick whirling motion by a string the larker commands; he also makes use of a decoy lark. These nets are used only till the 14th November: for the larks will not *dare*, or frolic in the air, except in fine sunny weather; and of course cannot be inveigled into the snare. When the weather grows gloomy, the larker changes his engine, and makes use of a trammel net, twenty-seven or twenty-eight feet long, and five broad; which is put on two poles, eighteen feet long, and carried by men under each arm, who pass over the fields and quarter the ground as a setting dog: when they hear or feel a lark hit the net, they drop it down, and so the birds are taken.

Multitudes of the inhabitants of each cluster of the Orkney isles feed during the season on the eggs of the birds of the cliffs. The method of taking them is so very hazardous, as to satisfy one of the extremity to which the poor people are driven for want of food. Copinsha, Hunda, Hoy, Foula, and Noss-head, are the most celebrated rocks; and the neighbouring natives the most expert climbers and adventurers after the game of the precipice. The height of some is above fifty fathoms; their faces roughened with shelves or ledges sufficient only for the birds to rest and lay there eggs. To these the dauntless fowlers will ascend, pass intrepidly from the one to the other, collect the eggs and birds, and descend with the same indifference. In most places the attempt is made from above: they are lowered from the slope contiguous to the brink, by a rope, sometimes made of straw, sometimes of the bristles of the hog: they prefer the last even to ropes of hemp, as it is not liable to be cut by the sharpness of the rocks; the former is apt to untwist. They trust themselves to a single assistant, who lets his companion down, and holds the rope, depending on his strength alone; which often fails, and the adventurer is sure to be dashed to pieces, or drowned in the subjacent sea. The rope is often shifted from place to place, with the impending weight of the fowler and his booty. The person above receives signals for the purpose, his associate being far out of sight; who, during the operation, by help of a staff, springs from the face of the rocks, to avoid injury from the projecting parts.

But the most singular species of bird-catching is on the holm of Noss, a vast rock severed from the isle of Noss by some unknown convulsion, and only about sixteen fathoms distant. It is of the same stupendous

height as the opposite precipice, with a raging sea between; so that the intervening chasm is of matchless horror. Some adventurous climber has reached the rock in a boat, gained the height, and fastened several stakes on the small portion of earth which is to be found on the top; correspondent stakes are placed on the edge of the correspondent cliffs. A rope is fixed to the stakes on both sides, along which a machine, called a craddle, is contrived to slide; and, by the help of a small paralled chord fastened in like manner, the adventurer wafts himself over, and returns with his booty.

The manner of bird-catching (see Pl. XCVII. fig. 7. in the Feroe islands) is so very strange and hazardous, that the description should by no means be omitted. Necessity compels mankind to wonderful attempts. The cliffs which contain the objects of their search are often two hundred fathoms in height, and are attempted from above and below. In the first case, the fowlers provide themselves with a rope 80 or 100 fathoms in length. The fowler fastens one end about his waist and between his legs, recommends himself to the protection of the Almighty, and is lowered down by six others, who place a piece of timber on the margin of the rock, to preserve the rope from wearing against the sharp edge. They have besides a small line fastened to the body of the adventurer, by which he gives signals that they may lower or raise him, or shift him from place to place. The last operation is attended with great danger, by the loosening of the stones, which often fall on his head, and would infallibly destroy him, was it not protected by a strong thick cap; but even that is found unequal to save him against the weight of the larger fragments of rock. The dexterity of the fowlers is amazing; they will place their feet against the front of the precipice, and dart themselves some fathoms from it, with a cool eye survey the places where the birds nestle, and again shoot into their haunts. In some places the birds lodge in deep recesses. The fowler will alight there, disengage himself from the rope, fix it to a stone, and at his leisure collect the booty, fasten it to his girdle, and resume his pendulous seat. At times he will again spring from the rock, and in that attitude, with a fowling-net placed at the end of a staff, catch the old birds which are flying to and from their retreats. When he hath finished his dreadful employ, he gives a signal to his friends above, who pull him up, and share the hard-earned profit. The feathers are preserved for exportation: the flesh is partly eaten fresh, but the greater portion dried for winter's provision.

The fowling from below has its share of danger. The party goes on the expedition in a boat; and when it has attained the base of the precipice, one of the most daring, having fastened a rope about his waist, and furnished himself with a long pole with an iron hook at one end, either climbs or is thrust up by his companions, who place a pole under his breach, to the next footing spot he can reach. He, by means of the rope, brings up one of the boat's crew; the rest are drawn up in the same manner, and each is furnished with his rope and fowling-staff. They then continue their progress upwards in the same manner, till they arrive at the region of birds; and wander about the face of the cliff in search of them. They then act in pairs;

Birds

one fastens himself to the end of his associate's rope, and, in places where birds have nestled beneath his footing, he permits himself to be lowered down, depending for his security on the strength of his companion, who has to haul him up again; but it sometimes happens that the person above is overpowered by the weight, and both inevitably perish. They fling the fowl into the boat, which attends their motions, and receives the booty. They often pass seven or eight days in this tremendous employ, and lodge in the crannies which they find in the face of the precipice.

Pl. XCVII.
fig. 8.

In some remote parts of Russia there is practised a singular invention for taking great quantities of gelinottes or grouse. They choose the most open places in the birch woods; and there they plant long forks in the earth opposite the larger trees. On these forks is laid a horizontal stick, gallows-wise, to which are tied small bundles of ears of corn. At a small distance from this part of the contrivance, is a kind of large funnel or inverted cone, made with long birch twigs, thin and flexible, the lower extremities of which are stuck in the earth, very near to one another; but by spreading towards the top, forms there an opening of above a yard in diameter. In this opening is placed a wheel made of two circles that intersect each other, and are surrounded with straw and ears of corn. This wheel turns on an axis fastened to the sides of the funnel in such a manner, that there is room enough between the sticks of the cone and the circles to admit of the wheel's turning freely about. The birds first perch upon the transverse stick near the tree; and when they have a mind to fall upon the corn tied to the wheel, they must necessarily stand upon one of the projecting parts of the circles of which it is composed. At that instant the wheel turns, and the gelinotte falls, head foremost, to the bottom of the trap, which is there so contracted that he cannot get out. They sometimes find the machine half full of gelinottes.

The following method of netting or catching of wild pigeons is eagerly pursued as a diversion in different parts of Italy, particularly by the inhabitants of Cava in the Higher Principato, and is thus described by Mr Swinburne. The people "assemble in parties; and if any stranger chances to stray to their rendezvous, give him a most cordial welcome. I am not in the least surprised (says Mr Swinburne) at their passionate fondness for this sport, as I found it extremely bewitching, keeping the attention constantly alive, and the springs of the mind pleasingly agitated by expectation; the situations where the toils are spread are incomparably beautiful, the air is pure and balsamic, and every thing around breathes health and satisfaction. When the periodical flights of stock-doves return from the northern and western parts of Europe to gain warmer regions for their winter abode, the fowler repairs to the mountain and spreads his nets across the intermediate hollows, the passes through which the birds direct their course, to avoid unnecessary elevation in their flight. These nets are hung upon a row of large trees planted for the purpose. The branches being very thick and close at top, and the bole lofty and bare, a great opening is left below for the toils, which reach to the ground; and, by means of pulleys, fall in a heap with the least effort. Sometimes they are extended upon poles that exceed the

height of the trees. At a small distance is a lofty circular turret, like a column with a little capital or cap, upon which a man is stationed to watch the approach of the game. As he commands a free view over all the country, and practice has made his sight as acute as that of the lynx, he descries the birds at a wonderful distance. The doves advance with great velocity; but the alert watchman is prepared for them; and just as they approach his post, hurls a stone above them with a sling: upon this the whole flock, whose fears have birds of prey for their great object, supposing the stone to be an enemy of that kind ready to pounce them, dart down like lightning to avoid the blow by passing under the trees; but there they rush into the jaws of death, by dashing against the net, which instantly drops and so entangles them that not one of them can escape the active hands of the fowler. These birds are sometimes taken by dozens at one fall, and are accounted fine eating. The dexterity with which the slingers manage their weapon is very remarkable; they throw the stone to a great height without any violent effort, and even without whirling the sling round before they discharge the pellet. In the Pyrenean mountains, where the same diversion is followed, the watchmen use a bow and arrow, trimmed with the feathers of a hawk."

The following simple but ingenious method of catching aquatic birds is used in Mexico by the natives. The lakes of the Mexican vale, as well as others of the kingdom, are frequented by a prodigious multitude of ducks, geese, and other water-birds. The Mexicans leave some empty gourds to float upon the water, where those birds resort, that they may be accustomed to see and approach them without fear. The bird-catcher goes into the water so deep as to hide his body, and covers his head with a gourd; the ducks come to peck at it; and then he pulls them by the feet under water, and in this manner secures as many as he pleases.

BIRD-LIME, a viscid substance, prepared after different ways. The most common bird-lime among us is made from holly-bark, boiled ten or twelve hours; when the green coat being separated from the other, it is covered up a fortnight in a moist place; then pounded into a tough paste, so that no fibres of the wood are discernible, and washed in a running stream till no motes appear; put up to ferment four or five days, skimmed as often as any thing arises, and laid up for use. To use it, a third part of nut-oil, or thin grease, must be incorporated with it over the fire.

The juice of holly-bark is a very peculiar substance. But if trials were made, it seems propable, that many other juices would be found to have the same clammy nature. The mistletoe affords a juice even superior to that of the holly; and if a young shoot of the common alder be cut through, there will a stringy juice draw out in threads, and follow the knife like bird-lime or the juice of the holly. It seems in this tree to be lodged, not in the bark, but in certain veins just within the circle of the wood. The roots of all the hyacinths also afford a tough and stringy juice of the same kind; and so does the asphodel, the narcissus, and the black bryony root, in a surprising quantity.

When twigs, &c. smeared with bird-lime, are to be put in places subject to wet, the common bird-lime is apt

Bird. apt to have its force soon taken away. It is necessary, therefore, to have recourse to a particular sort, which from its property of bearing water unhurt, is called *water bird-lime*; and is prepared thus: Take a pound of strong and good bird-lime; wash it thoroughly in spring-water, till the hardness is all removed; and then beat it well, that the water may be clean separated, so as not a drop remains; then dry it well, and put it into an earthen pot; add to it as much capon's grease as will make it run. Then add two spoonfuls of strong vinegar, one spoonful of oil, and a small quantity of Venice turpentine. Let the whole boil for some minutes over a moderate fire, stirring it all the time. Then take it off; and when there is occasion to use it, warm it, and cover the sticks well with it. This is the best sort of bird-lime for snipes and other birds that love wet places.

The most successful method of using the common bird lime is this: Cut down the main branch or bough of any bushy tree whose twigs are thick, straight, long, and smooth, and have neither knots nor prickles. The willow and the birch-tree afford the best of this kind. Let all the superfluous shoots be trimmed off, and the twigs all made neat and clean; they must all be well covered with the bird-lime, within four inches of the bottom; but the main bough from which they grow must not be touched with the lime. No part of the bark, where the lime should come, must be left bare: but it is a nice matter to lay it on properly; for if it be too thick it will give the birds a distaste, and they will not come near it; and if there be too little of it, it will not hold them when they are there. When the bush is thus prepared, it must be set up in some dead hedge, or among some growing bushes near the outskirts of a town, a farmer's back-yard, or the like, if it be in the spring; for these places are the resort of the small birds at that time. If it be used in summer, the bush must be placed in the midst of a quick-set hedge, or in groves, bushes, or white-thorn trees, near fields of corn, hemp, flax, and the like; and in the winter, the proper places are about stacks of corn, hovels, barns, and the like. When the lime-bush is thus planted, the sportsman must stand as near it as he can, without being discovered; and with the mouth, or otherwise, make such sorts of notes as the birds do when they attack or call to one another. There are bird-calls to be bought for this use; but the most expert method is to learn the notes of call of the several birds, and imitate them by a sort of whistling. When one bird is thus enticed to the bush, and hung fast, the business of the sportsman is not to run up to take it, but to be patient; for it will hang itself more fast by its struggling to get away; and its fluttering will bring more to the bush, so that several may be taken together. The time of the day for this sport is from sun-rise to ten o'clock, and from one to sun-set. Another very good method of bringing the birds together, is by a stale: a bat makes a very good stale; but it must be fastened, so as

to be in sight at a distance. An owl is a still better stale; for this bird never goes abroad but it is followed by all the small birds in the neighbourhood. They will gather together in great numbers about it; and having no convenient place to sit on but the lime-bush, will be taken in great numbers. If a living owl or bat is not to be had, the skin stuffed will serve the purpose, and will last twenty years. Some have used the image of an owl carved in wood, and painted in the natural colours; and it has been found to succeed very well.

Divination by BIRDS.

Migration of BIRDS.

Nidification of BIRDS.

} See { AUGURY.

{ MIGRATION.

{ ORNITHOLOGY.

Singing BIRDS are, the nightingale, blackbird, starling, thrush, linnet, lark, throstle, Canary-bird, bulfinch, goldfinch, &c. See some very curious experiments and observations on the singing of birds, Phil. Transf. vol. lxiii. part ii. N^o 31. Their first sound is called *chirp*, which is a single sound repeated at short intervals; the next *call*, which is a repetition of one and the same note; and the third sound is called *recording*, which a young bird continues to do for ten or eleven months, till he is able to execute every part of his song; and when he is perfect in his lesson, he is said to *sing his song round*. Their notes are no more innate than language in man; they all sing in the same key. The honourable author Daines Barrington has there attempted to reduce their comparative merits to a scale: and to explain how they first came to have particular notes. See *SONG of Birds*.

Methods of preserving BIRDS from putrefaction, and so as to retain their natural form and position, as well as the beauty of their colours and plumage.—A good antiseptic for animal substances has been much inquired after; as for want of it, many curious animals, and birds particularly, come to our hands in a very imperfect state; some from foreign parts entirely miscarry, and others of the finest plumage are devoured by insects. Various methods of preservation, therefore, have been of late described*; but the following improved methods by Dr Lettson† seem to be the least troublesome and the most complete.

“After opening the bird by a longitudinal incision from the breast to the vent; dissecting the fleshy parts from the bones; and removing the entrails, eyes, brains (F), and tongue; the cavities and inside of the skin are to be sprinkled with the powders mentioned below: the eyes (G) are then to be inserted, and the head stuffed with cotton or tow: in the next place, a wire is to be passed down the throat through one of the nostrils, and fixed into the breast-bone: wires are also to be introduced through the feet, up the legs and thighs, and inserted into the same bone; next, fill the body with cotton to its natural size, and sew the skin over it: the attitude is lastly to be attended to; and in whatever position the subject is placed to dry, that same position will be retained afterwards.

“The

(F) In large birds, the brains may be extracted by the eyes; the best instrument for this purpose is a director used by surgeons, which may be had of an instrument-maker at a trifling expence.

(G) Wax (used by some) is not a proper substance for eyes; there are persons in London, whose business it is to make glass-eyes of any size or colour, at a penny or two-pence a pair.

Bird.

"The drying compound is as follows:

Corrosive sublimate,	-	$\frac{1}{4}$ lb.
Saltpetre prepared or burnt,	-	$\frac{1}{2}$ lb.
Alum burnt,	-	$\frac{1}{4}$ lb.
Flowers of sulphur,	-	$\frac{1}{2}$ lb.
Camphor,	-	$\frac{1}{4}$ lb.
Black pepper,	-	1 lb.
Tobacco ground course,	-	1 lb.

Mix the whole together, and keep it in a glass vessel stopped close.

"Small birds may be preserved in brandy, rum, arrack, or first runnings; though in this manner the colour of the plumage is liable to be extracted by the spirit.

"Large sea-fowl have thick strong skins, and such may be skinned; the tail, claws, head, and feet, are carefully to be preserved, and the plumage stained as little as possible with blood. The inside of the skin may be stuffed as recommended above.

* Phil.

"Kuckahn observes*, that 'baking is not only useful in fresh preservations, but will also be of very great service to old ones, destroying the eggs of insects; and it should be a constant practice once in two or three years to bake them over again, and to have the cases fresh washed with camphorated spirit, or the sublimate solution, which would not only preserve collections from decay much longer, but also keep them sweet.'

"One of the best preservatives, is to procure close boxes, well glazed: with such a precaution I have kept them in a dry room many years without the least appearance of injury. Baking is apt to crimp and injure the plumage, unless great care be used; and therefore the proper degree of heat should be ascertained by means of a feather, before such subjects are baked.

"When the subject is to be kept for some time in a hot climate, it should be secured in a box filled with tow, oakum, or tobacco, well sprinkled with the sublimate solution."

In Guiana the number and variety of beautiful birds is so great, that several persons in the colony advantageously employ themselves, with their slaves and dependents, in killing and preserving these animals for the cabinets of naturalists in different parts of Europe.

* Natural History of Guiana.

The method of doing this, as related by Mr Bancroft †, is, "to put the bird which is to be preserved in a proper vessel, and cover him with high wines, or the first running of the distillation of rum. In this spirit he is suffered to remain for 24 or 48 hours, or longer, according to his size, till it has penetrated through every part of his body. When this is done, the bird is taken out; and his feathers, which are no ways changed by this immersion, are placed smooth and regular. It is then put into a machine, made for the purpose, among a number of others, and its head, feet, wings, tail, &c. are placed exactly agreeable to life. In this position they are all placed in an oven, very moderately heated, where they are slowly dried; and will ever after retain their natural position, without danger of putrefaction."

* Nat. Hist. of Birds, Vol. II. p. 119, &c.

Mr Edward's Recipe for making Pictures of BIRDS, with their natural feathers †. First, take a thin board, or pannel of deal, or wainscot well seasoned, that it may not shrink; then smoothly paste on it white paper, and let it dry; and if the wood casts its colour through,

you may paste on a second paper, and it will be whiter: let the second paper dry; then get ready any bird that you would represent, and draw it as exact as may be on your papered pannel, of its natural size (middle-sized birds are best for this work); then paint what ground-work, or tree, or other thing, you design to set your bird on, together with the bill and legs of the bird in water-colours, leaving the bird to be covered with its own natural feathers. You must first prepare the part to be feathered, by laying on pretty thick gum Arabic, dissolved in water, with a large hair-pencil: then lay the pannel flat, and let it dry hard; and when dry, cover it with your gum-water a second time, and let it dry; and then a third, in case you do not find it lie with a good body on the paper; the thickness of a shilling, when dried hard, is sufficient. When your piece is thus prepared, take the feathers off from your bird as you use them; beginning always at the tail and points of the wing, and working upwards to the head; observing to cover that part of your draught with the feather that you take from the same part in your bird, letting them fall one over another in their natural order: you must prepare your feathers by cutting off the downy part that is about their bottoms; and the larger feathers must have the insides of their shafts shaved off with a knife to make them lie flat; the quills of the wings must have their inner webs clipped off, that in laying them the gum may hold them by their shafts. When you begin to lay them, take a pair of steel pliers to hold the feathers in; and have some gum-water, not too thin, and a large pencil, ready to moisten the gummy ground-work by little and little as you work it: then lay your feathers on the moistened parts; which must not be waterish, but something tacky or clammy to hold the feathers. You should prepare a parcel of small leaden weights, in the form of sugar-loaves; which you may cast in sand, by first making holes in its surface with a pointed stick: these weights will be necessary to set on the feathers you have newly laid on, to hold them to the gum till they are dry and fixed: but you must be cautious lest the gum come through the feathers; for it not only smears them, but dries to the bottoms of the weights, and you will be apt to pull off the feathers with the weights, which will disorder your work: when you have wholly covered your bird with feathers, you must with a little thick gum stick on a piece of paper cut round, of the bigness and in the place of the eye, which you must colour like the eye of the bird. When the whole is dry, dress the feathers round the outline that may chance to stare a little, and rectify what may be mended in any other part: then lay a sheet of clean paper on it; and on that a heavy book, or some such thing, to press it: after which it may be preserved in a frame covered with a glass.

BIRDS, in heraldry, according to their several kinds, represent either the contemplative or active life. They are the emblems of liberty, expedition, readiness, swiftness, and fear. They are more honourable bearings than fishes, because they participate more of air and fire, the two noblest and highest elements, than of earth and water. Birds must be borne in coat-armour, as is best fitting the propriety of their natural actions of going, sitting, standing, flying, &c. Birds that are either whole-footed, or have their feet divided, and yet have

Bird.

Bird.

have no talons, are said to be *membered*; but the cock, and all birds of prey with sharp and hooked beaks and talons for encounter or defence, are termed *armed*. In the blazoning of birds, if their wings be not displayed, they are said to be borne close; as, *he beareth an eagle, &c. close*.

• See *Hirundo*.

BIRDS-Nests, in cookery, the nest of a small Indian swallow*, very delicately tasted, and frequently mixed among soups. On the sea-coasts of China, at certain seasons of the year, there are seen vast numbers of these birds; they leave the inland country at their breeding time, and come to build in the rocks, and fashion their nests out of a matter which they find on the shore, washed thither by the waves. The nature of this substance is scarcely yet ascertained. According to Kempter, it is molluscæ or sea-worms; according to M. le Poivre, fish-spawn; according to Dalrymple, sea-weeds; and according to Linnæus, it is the animal substance frequently found on the beach, which fishermen call *blubbers* or *jellies*. The nests are of a hemispheric figure, and of the size of a goose's egg, and in substance much resemble the ichthyocolla or *isinglass*. The Chinese gather these nests, and sell them to all parts of the world; they dissolve in broths, &c. and make a kind of jelly of a very delicious flavour.

These nests (Mr Marsden informs us) are found in great abundance in the island of Sumatra, particularly about Croe, near the south end of the island. Four miles up the river of that name is a large cave, where the birds build in vast numbers. The nests are distinguished into white and black; of which the first are by far the more scarce and valuable, being found in the proportion of one only to twenty-five. "The white sort (says Mr Marsden) sells in China at the rate of 1000 to 1500 Spanish dollars the pecul; the black is usually disposed of at Batavia for about 20 dollars the same weight, where it is chiefly converted into glue, of which it makes a very superior kind. The difference between the two has by some been supposed to be owing to the mixture of the feathers of the birds with the viscous substance of which the nests are formed; and this they deduce from the experiment of steeping the black nests for a short time in hot water, when they are said to become in a great degree white. Among the natives I have heard a few assert that they are the work of a different species of bird. It was suggested to me, that the white might probably be the recent nests in which they were taken; and the black, such as had been used for a number of years successively. This opinion appearing plausible, I was particular in my inquiries as to that point, and learned what seemed much to corroborate it. When the natives prepare to take the nests, they enter the caves with torches, and forming ladders according to the usual mode, of a single bamboo notched, they ascend and pull down the nests, which adhere in numbers together, from the side and top of the rock. They informed me, that the more frequently and regularly the cave is stripped, the greater proportion of white nests they are sure to find, and that on this experience they often make a practice of beating down and destroying the old nests in larger quantities than they trouble themselves to carry away, in order that they may find white nests the next season in their room. The birds, during the building time, are seen in large flocks on the beach,

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collecting in their bills the foam which is thrown up by the surf, of which there is little doubt but they construct their nests, after it has undergone perhaps a preparation, from a commixture with their saliva, or other secretion with which nature has provided them for that purpose."

BIREMIS, in Roman antiquity, a vessel with two rows of oars; concerning the disposition of which authors are not agreed.

BIRETUM, or BIRKETUM, a sort of black bonnet, or covering of the head, in form of a pyramid, much used in Italy and France, about 500 or 600 years ago, as a badge of victory, honour, or sacerdotal preferment.

BIRKENHEAD, or BERKENHEAD (Sir John), a famous political author, born about the year 1615. Being recommended to Dr William Laud archbishop of Canterbury, he became his secretary; in which office he showed such capacity and diligence, that the archbishop, by his diploma, created him master of arts in 1639; and in the year following, by letter commendatory from the same prelate, he was chosen probationer fellow of All-Soul's College. This obliged him to reside constantly at Oxford; and on King Charles I.'s making that city his head-quarters during the civil war, our author was made choice of to write a kind of journal in defence of the royal cause, by which he gained great reputation. By his majesty's recommendation, he was chosen reader in moral philosophy; which employment he enjoyed till 1648, when he was expelled by the parliament visitors. He retired afterwards to London, where he wrote several poetical pieces; and having adhered steadily to his principles, he acquired the title of the *loyal poet*, and suffered several imprisonments. He published, while he thus lived in obscurity, some very satirical compositions, mostly levelled against the republican grandees, and written with great poignancy. Upon the restoration of King Charles II. our author was rewarded for his loyalty. He was created, April 16. 1661, on the king's letters sent for that purpose, doctor of the civil law by the university of Oxford; and in that quality, as an eminent civilian, was consulted by the convocation on the question, Whether bishops ought to be present in capital cases? He was about the same time elected to serve in parliament for Wilton in the county of Wilts. He was knighted November 14. 1662; and upon Sir Richard Fanshawe's going in a public character to the court of Madrid, he was appointed to succeed him as master of requests. He lived afterwards in credit and esteem, and received various favours from the court, which, however, drew upon him some very severe attacks from those who opposed the court. Mr Wood has treated him with great severity; but his memory has been transmitted with honour to posterity by others, particularly by Dryden, Langbaine, and Winstanly. He died in Westminster December 4. 1679; and was interred in St Martin's in the Fields.

BIRKENFIELD, a town of Germany, capital of a county of the same name in the circle of the Upper Rhine. It is seated near the river Nave, in E. Long. 7. 9. N. Lat. 49. 35.

BIRMINGHAM, a very large town of Warwickshire in England, situated in W. Long. 1. 35. N. Lat. 52. 30. It is no corporation, being only go-

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verned by two constables and two bailiffs; and it is therefore free for any person to come and settle there; which has contributed greatly not only to the increase of the buildings, but also of the trade, which is the most flourishing of any in England for all sorts of iron work, besides many other curious manufactures. The town stands on the side of a hill, nearly in the form of a half-moon. The lower part is filled with the workshops and warehouses of the manufacturers, and consists chiefly of old buildings. The upper part of the town contains a number of new and regular streets, and a handsome square elegantly built. It has several churches; particularly one in the lower part of the town, which is an ancient building with a very tall spire; and another, which is a very grand modern structure, having a square stone tower with a cupola and turret above it. The houses in this town amount to between 7000 and 8000, and their number is continually increasing.

BIRON (Armand de Gontault, Lord of), Marshal of France, and a celebrated general in the 16th century, signalized himself by his valour and conduct in several sieges and battles. He was made grand master of the artillery in 1569, and no body dared to assault him at the massacre of St Bartholomew. He was the first who declared for Henry IV. He brought a part of Normandy under his subjection, and dissuaded him from retiring to England or Rochelle. But he was killed by a cannon ball, at the siege of Epernay, on the 26th of July 1592. He was a very universal scholar: and used to carry a pocket-book, in which he wrote down every thing that appeared remarkable; which gave rise to a proverb very much used at court: When a person happened to say any thing uncommon, they told him, *You have found that in Biron's pocket-book.*

BIROTA, or BIROTUM, in Roman antiquity, a kind of vehicle, so denominated from its moving upon two wheels. It carried about 200 pound weight, and was drawn by three mules.

BIRRUS, in Roman antiquity, a cloak, made of woollen cloth, worn by the soldiers. Also a robe anciently worn by the priests or bishops.

BIRTH, in midwifery, signifies the same with delivery. See MIDWIFERY.

BIRTH is also used for a person's descent; and is said to be high or low according to the circumstances of his ancestry.

There is scarce any truth (Mr Knox observes in his Essays) of which the world has been more frequently reminded by the moralists, than the unreasonableness of that veneration which is paid to birth. They have been told, that virtue alone is true nobility; but tho' they have acknowledged the assertion to be founded in reason, they have continued, with uniform perseverance, in the same error. The luminous glory of an illustrious ancestor, seems to have diffused a brilliancy over a long line of descendants, too opaque of themselves to emit any original irradiations.

"Gratitude (continues our elegant author), which first raises a benefactor to a distinguished rank in civil honours, is willing to continue its kindness to his immediate offspring. The distinction is rendered hereditary. This predilection for an ancestor soon leads to the accumulation of honours and possessions in his successors; and the incense originally offered, because

it was deserved, is at last lavished at the shrine of opulence, independently of merit.

"Subordination is, indeed, essential to society. The order of nobles, as hereditary guardians of the laws, is found an useful political establishment; and none seem so well adapted to supply it, as they who have been raised to eminence by their ancestors, and who possess a territorial patrimony in the land which they are to protect. All that is contended for is, that the recommendation of birth may not set aside or depreciate real merit, the praise of learning, and the intrinsic value of virtuous exertions.

"It is a remarkable circumstance in the history of mankind, that some of the best books have been written, and some of the greatest achievements performed, by those whose origin was truly plebeian. The politest and genteelst books, whether the sentiments or the style be considered, have been produced by slaves, or the descendants of slaves. Horace, Phœdrus, and Terence, wrote in a style which must have been the standard of a court, to an intercourse with which they were by no means intitled by their extraction. The founders of the most distinguished families emerged from the middle and the lower classes, by the superior vigour of their natural abilities, or by extraordinary efforts, assisted by fortune: and unless the adventitious circumstances of wealth and civil honours can effect a change in the constituent principles of the mind and body, there is certainly no real superiority to be derived in a boasted pedigree of Tudors and Plantagenets. And yet there have appeared flatterers, who have indirectly suggested, that the minds of the nobility seem to be cast in a finer mould, and to have an elegance inherent in their original constitution. According to this hypothesis, we must go on to suppose, that the mind of a commoner exalted to the higher order of senators, catches this elegance by the contagion of invisible effluvia. On his creation he undergoes a kind of new birth, and puts off the exuviae which encumbered and degraded him in the lower regions. Thus are all the occult perfections of noble blood to be infused by the mandate of a monarch. 'But no,' said Maximilian to a man who asked to be ennobled by him, 'though I can give you riches and a title, I cannot make you noble.'

"In truth, there is many a nobleman, according to the genuine idea of nobility, even at the loom, at the plough, and in the shop; and many more in the middle ranks of mixed society. This genuine idea contains in it generosity, courage, spirit, and benevolence, the qualities of a warm and open heart, totally unconnected with the accidental advantages of riches and honour; and many an English sailor has possessed more of the real hero than a lord of the admiralty.

"If indeed there is any substantial difference in the quality of their blood, the advantage is probably on the side of the inferior classes. Their indigence and their manual employments require temperance and exercise, the best purifiers of the animal juices. But the indolence which wealth excites, and the pleasures which fashionable life admits without restraint, have a natural tendency to vitiate and enfeeble the body as well as the mind: and among the many privileges inherited by him who boasts nobility in his veins, he commonly receives the seeds of the most painful and the

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the impurest diseases. He displays indeed a coronet on his coat of arms, and he has a long pedigree to peruse with secret satisfaction; but he has often a gout or a scrophula, which make him wish to exchange every drop derived from his Norman ancestors, for the pure tide that warms a peasant's bosom.

"The spirit of freedom, moral, mental, and political, which prevails in Britain, precludes that unreasonable attachment to birth, which, in the countries of despotism, tends to elevate the noble to a rank superior to humanity. In our neighbour's land, the region of external elegance united with real meanness, the implicit veneration paid to birth adds to the weight of legal oppression. A Frenchman of the plebeian order attends to a Count or a Marquis with all the silent submission of idolatry: on the contrary, there is no doubt but that an English gondolier would box with the best lord in the land, if he were affronted by him, without the least regard for his star and ribbon. It would indeed be an additional pleasure to the natural delight of conquest, to have bruised a puny lord. Even the more refined and polished do not idolize illustrious birth. In truth, wealth appears to be the object of more universal veneration. Noble blood and noble titles, without an estate to support them, meet with great compassion indeed, but with little respect; nor is the man who has raised himself to eminence, and who behaves well in it, neglected and despised because he derives no lustre from his forefathers. In a commercial country, where gain is the general object, they who have been most successful in its pursuit will be revered by many, whatever was their origin. In France, where honour is pursued from the monarch to the cleanser of a jakes, the distinction of birth, even with extreme poverty, is enviable. The brother of a Marquis would rather starve on a beggarly pension, than pollute himself with a trade by which he might acquire the revenues of a German kingdom. In our land of good sense this folly is losing ground; and the younger brothers of noble houses, often think it no disgrace to rival the heir in a princely fortune acquired by honourable merchandise.

"As the world becomes more enlightened, the exorbitant value which has been placed on things not really valuable will decrease. Of all the effects of man's capricious admiration, there are few less rational than the preference of illustrious descent to personal merit, of diseased and degenerate nobility to health, to courage, to learning, and to virtue. Of all the objects of pursuit which are not in our own power, the want of distinguished birth may most easily be dispensed with, by those who possess a solid judgment of that which makes and keeps us happy. There may be some reason to repine at the want of wealth and fame; but he who has derived from his parent health, vigour, and all the powers of perception, need not lament that he is unnoticed at the herald's office.

"It has been observed, that virtue appears more amiable when accompanied with beauty; it may be added, that it is more useful when recommended to the notice of mankind by the distinction of an honourable ancestry. It is then greatly to be wished, that the nobly born would endeavour to deserve the respect which the world pays them with alacrity, by employing

their influence to benevolent purposes; to those purposes which can at all times be accomplished, even when the patriotic exertions of the field and cabinet are precluded."

BIRTH, or *Berth*, the station in which a ship rides at anchor either alone or in a fleet, or the distance between the ship and any adjacent object, comprehending the extent of the space in which she ranges at the length of her cables: as, *she lies in a good birth*, i. e. in a convenient situation, or at a proper distance from the shore and other vessels; and where there is good anchoring ground, and shelter from the violence of the wind and sea.

BIRTH also signifies the room or apartment where any particular number of the officers and ship's company usually mess and reside. In a ship of war there is commonly one of these between every two guns.

BIRTH-DAY, the anniversary return of the day whereon a person was born. The ancients placed a good deal of religion in the celebration of birth-days, and took omens from thence of the felicity of the coming year. The manner of celebrating birth-days was by a splendid dress: wearing a sort of rings peculiar to that day: offering sacrifices; the men to their genius, of wine, frankincense; the women to Juno: giving suppers, and treating their friends and clients; who in return made them presents, wrote and sung their panegyrics, and offered vows and good wishes for the frequent happy returns of the same day. The birth-days of emperors were also celebrated with public sports, feasts, vows, and medals struck on the occasion. But the ancients, it is to be observed, had other sorts of birth-days besides the days on which they were born. The day of their adoption was always reputed as a birth-day, and celebrated accordingly. The emperor Adrian, we are told, observed three birth-days; viz. the day of his nativity, of his adoption, and of his inauguration. In those times it was held, that men were not born only on those days when they first came into the world, but on those also when they arrived at the chief honours and commands in the commonwealth, e. gr. the consulate. Hence that of Cicero in his oration *ad Quirites*, after his return from exile: *A parentibus, id quod necesse erat, parvus sum procreatus; a vobis natus sum consularis.*

BIRTHWORT, in botany. See *ARISTOLOCHIA*.

BIRVIESCA, a town of Old Castile in Spain, and capital of a small territory called *Bureva*. W. Long. 2. 15. N. Lat. 42. 35.

BIRZA, a town of Poland in the province of *Samogitia*. E. Long. 25. 5. N. Lat. 56. 35.

BISA, or *Biza*, a coin of Pegu, which is current there for half a ducat. It is also a weight used in that kingdom.

BISACCIA, a small handsome town of Italy, in the Ulterior Principato, and in the kingdom of Naples, with a bishop's see. E. Long. 15. 35. N. Lat. 41. 3.

BISACUTA, in middle-age writers, an axe with two edges, or which cuts either way; or a missile weapon pointed at both ends. Walsingham represents the *securis bisacuta* as peculiar to the Scottish nation. See *BATTLE-AXE*.

BISBÆA, a feast celebrated by the Messapii after

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Biscara,
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the pruning of their vines, to obtain of the gods that they might grow again the better. The word is formed from *βισκον*, used by some for a vine.

BISCARA, a town of Africa in the kingdom of Algiers, seated in the eastern or Levantine government, in E. Long. 5. 50. N. Lat. 35. 10. This city belonged to the province of Zeb in Numidia, which lies south of the kingdom of Labez; but the Algerines, in their annual inroads to carry off slaves, made themselves masters of Biscara, in order to facilitate their entrance into the southern provinces. It retains still some remains of the ancient city that gave name to this territory; and hath a garrison to keep the inhabitants in awe, and who usually bring lions, tigers, and other wild beasts for sale to strangers. The city of Algiers is never without a great number of Biscarans, who are employed in the hardest and lowest office, as cleansing of streets, emptying of vaults, sweeping chimneys, &c.; and when they have got about 10 or 12 crowns by this drudgery, they return to their country, where they are respected as worthy men on account of their money, the inhabitants of this province being almost entirely destitute of coin, and reckoned the most miserable of all the Arabian tribes.

BISCAY, a province of Spain, bounded on the north by the sea called the *Bay of Biscay*, on the south by Old Castile, on the west by Asturias of Santilana, and on the east by the territories of Alava and Guipuscoa. It is in length about seventy-four miles; but the breadth is much less, and very unequal. This country in general is mountainous and barren; but in some places it produces corn, and every where a great quantity of apples, oranges, and citrons. They make cyder with the apples, which is their common drink. Besides this, they have wine called *chacolino*, which is pleasant, but will not keep long, and therefore is used instead of small beer. Their valleys produce a little flax, and their hills a great deal of timber for ships. The sea affords them excellent fish of all sorts. The wool that is exported here comes from Old Castile; but their greatest riches are produced by their mines of iron; which metal is extremely good, and is transported to all parts. They have likewise artificers that work in iron; and are, in particular, famous for working swords and knives. Biscay is the country of the ancient Cantabri, so imperfectly subdued by Augustus, and so slightly annexed to the Roman empire. Their mountains have in all ages afforded them temptations and opportunities of withdrawing themselves from every yoke that has been attempted to be imposed upon them. Their language is accounted aboriginal, and unmixed with either Latin, French, or Spanish. It is so totally different from the Castilian, that we seldom meet with any of the peasants that understand one word of Spanish. The Biscayners are stout, brave, and choleric to a proverb. The best sailors in Spain belong to the ports of Biscay, and its mountains produce a very valuable race of soldiers. Their privileges are very extensive, and they watch over them with a jealous eye. They have no bishops in the province, and style the king only *Lord of Biscay*. The men are well-built and active, like all mountaineers. The most singular thing in their dress is the covering of their legs: they wrap a piece of coarse grey or black woollen cloth round them, and fasten it on with many turns of tape. The women are

beautiful, tall, light, and merry; their garb is neat and pastoral; their hair falls in long plaits down their backs; and a veil or handkerchief, twisted round in a coquetish manner, serves them for a very becoming head-dress. On Sundays they generally wear white, tied with rose-coloured knots. The chief towns in it are Bilboa, Ordunna, Durango, Fontarabia, St Sebastian, Tolosa, and Victoria.

BISCAY (New), a province of North America, in the audience of Guadalajara. It has New Mexico on the north, Culiacan on the west, Zacatecas on the south, and Panuca with Florida on the east. It is about 300 miles from east to west, and 360 from north to south. In general it is well watered, fruitful, moderately temperate, and abounds in all sorts of provisions, except the mountains of Topia, which are barren. The original inhabitants are not all brought under subjection, they having four large towns in the morasses, that are of difficult access; for this reason the Spaniards have built three small fortified towns, which are well inhabited, for the defence of their silver mines. The latitude is from 25 to 28 degrees.

BISCHOFISHEIM, a town of Germany, in the archbishopric of Mentz, and circle of the Lower Rhine, seated on the river Tauber, near the frontiers of Franconia, E. Long. 9. 37. N. Lat. 49. 40.

BISCHOFF-ZELL, a town of Switzerland, belonging to the bishop of Constance. There is a castle wherein the bishop's bailiff resides, who receives half the fines; but he has nothing to do with the town, nor is there any appeal from the council of the town. It is seated on the Thur, at the place where the Sitter falls into this river almost half way between Constance and St Gall. E. Long. 9. 23. N. Lat. 47. 33.

BISCHOP, or BISKOP, (John de), an excellent artist, born at the Hague in 1646. He is spoken of with great commendation as a painter, and his drawings from the great masters are held in the highest estimation by the curious. In these he had succeeded so happily, as to preserve with the greatest exactness the style of the painter whose pictures he copied. But as an engraver he is most generally known; and his works are numerous. They are chiefly etchings, harmonized with the graver; and though slight, yet free, spirited, and pleasing. He gives a richness to the colour, and a roundness to the figures, far beyond what is usually done with the point, so little assisted by the graver. His figures in general are well drawn; but in a manner, rather than a correct, style. The extremities indeed are not always well marked, or his heads equally expressive or beautiful. It is said of him, that he owed his excellence to his own genius alone, having never studied under any master by whose instruction he might have been benefited. He worked chiefly at Amsterdam, where he died in 1686, aged 40 years.

BISCHOP (Cornelius), portrait and history painter, was born at Antwerp in 1630, and was the disciple of Ferdinand Bol. His pencil, his tint of colouring, his style and manner, had a strong resemblance of his master; and by many competent judges he is esteemed not inferior to him in historical subjects as well as in portrait, having been always assiduous to study after nature. A painting by this master, consisting of a few figures by candle light, was so much admired by Louis XIV. that he purchased it at an high price, and it is placed

Biscay

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Bischof

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placed in the royal collection; and the King of Denmark admitted his works among those of the best masters. However, notwithstanding the encomiums bestowed on this master by the Flemish writers, an impartial judge would perhaps think his compositions but heavy and without expression, and his works in general not worthy of all that commendation which is lavished upon them. He died in 1674.

BISCHOP (Abraham), son of Cornelius Bischof, was instructed by his father to design historical subjects and portraits; but preferred the painting of fowl, particularly those of the domestic kind, to any other subjects which were recommended to him. He designed every object after nature, and usually painted in a large size, such as ornamental furniture for grand halls; and every species of fowl was so exactly like nature in its attitude, character, and plumage, that his works were beheld with universal approbation.

BISCHWELLER, a fortress of Alsace, seated in E. Long. 7. 0. N. Lat. 48. 40.

BISCHROMA, in music, the same as our triple quaver. See CHROMA.

BISCUTELLA, BUCKLER-MUSTARD, or *Bastard Mithridate-mustard*: A genus of the tetradynamia order, belonging to the filiculosa class of plants; and in the natural method ranking under the 39th order, *Siliquose*: The filicula is flat-compressed, rounded, above and below two-lobed, and the leaves of the calyx are gibbous at the base.

Of this there are three species: the auriculata, with small pods joined to the style; the didyma, with a double orbicular pod diverging from the style; and the apula, with flowers growing in spikes, and a shorter style. They are natives of France, Italy, and Germany.

BISEGLIA, a populous town of Italy in the kingdom of Naples and Terra de Bari, with a bishop's see, seated near the Gulph of Venice, in E. Long. 16. 49. N. Lat. 41. 18.

BISERRULA: A genus of the decandria order, belonging to the diadelphia class of plants; and in the natural method ranking under the 32d order, *Papilionacea*: The legumen is bilocular and flat; and the partition contrary. Of this genus there is only one species known; viz. the pelecinus, an annual plant with purple flowers, growing in Italy, Sicily, Spain, and the south of France.

BISERTA, a town of the kingdom of Tunis in Africa, seated on a gulf of the same name, in E. Long. 10. 40. N. Lat. 37. 20. The gulf is a very large one, and the *Sinus Hipponensis* of the ancients. It is formed by the Capes Blanco and Ziebeb; and has a beautiful sandy inlet near four leagues wide, which once admitted the largest vessels, but through the negligence of the Turks can now admit only those of the smallest size, and is in danger in a short time of being totally choaked up. Some remains of the great pier of Hippo are still extant; by which it appears to have run out into the sea so as to break the north-east wind, and make this one of the safest and most beautiful heavens in these parts. On the south, this gulf hath a communication with a lake of the same name, so as to form a kind of canal between it and the Mediterranean Sea. Through this canal a constant stream is observed alternately discharging itself from the sea to the lake, and from the

lake to the sea, in the same manner as the Atlantic Ocean is observed to do in the Mediterranean, and back again; so that what the lake loses by exhalations is soon recruited by the sea, which in hot seasons runs into it with a very brisk current to keep up the equilibrium. The millets of this lake are the best in Barbary; great quantities of their roes dried and made into BOTARGO, are sent from hence into the Levant, where they are accounted a great dainty. The town was formerly very considerable; and, though not above a mile in circuit, is said to have contained 6000 houses; whereas both it and the villages under it now scarce contain that number of inhabitants. It has still, however, some strong castles and batteries to defend it, especially towards the sea. There are also two very capacious prisons for slaves, a large magazine or warehouse for merchandize, and two towers with some other outworks to defend the entrance of the haven. The city, though so near the sea, is well supplied with fresh water from springs that surround it on every side towards the land. It is likewise well furnished with variety of fish from the adjacent lake. Most of the inhabitants of Biserta, as well as of the adjacent country on both sides of the canal, are employed in the fishing trade, which begins about the end of October, and ends in the beginning of May; for the rains then sweetening the waters, make the fish come into it in vast quantities during that season; but afterwards they either disappear or grow lean, dry, and unfit to eat. The people here are extremely poor; yet very proud, ill-natured, and faithless; insomuch that Muley Hafun Bey, one of their sovereigns, used to say, that none of his subjects deserved his resentment so much as they, since neither fear nor love could keep them faithful.—Biserta hath about eight villages under its government; a large plain called *Matter* or *Mater*; and the territory of Choros, the *Clypea* or *Corobis* of the ancients. This is a tract of great extent, and would be very fertile were it not for the frequent incursions of the Arabs. The people are very poor, live meanly, and go worse clad. Their choicest dainty is their couscou, a kind of cake made of flour, eggs, and salt, which they dry and keep all the year round. Their dress is nothing else than a piece of coarse cloth wrapped round their bodies, and another round their heads by way of a turban; and most of them go barefooted and barelegged. The poorer sort have nothing but a few skins laid on the floor to sleep upon; but the rich have narrow couches fixed against the wall, about five or six feet high, to which they mount by a ladder. They are very expert horsemen, as most in these countries are, and ride without saddle or bridle; nor do they ever shoe their horses. They are still more miserable from the neighbourhood of the Arabs, who living altogether by plunder, robbery, and murder, oppress the poor inhabitants with their frequent inroads and cruel exactions. The Bisertines, both of the city and country, are the most superstitious people in Barbary, scarce going any where without hanging a quantity of amulets about their own, or if they ride, their horses neck also. These amulets are only scraps of parchment or paper, with some strange characters written upon them, which they sew up in a piece of leather, silk, &c. and imagine when worn about them to be a preservative against all accidents.

Biserta.

Biset,
Bishop.

BISET (Charles Emanuel), a painter of considerable eminence, was born at Mechlin in 1633; and even in his early productions showed a lively and ready invention. He was remarkable for introducing a multitude of figures into his designs, with an extraordinary variety of drapery peculiar to every nation. His general subjects were conversations, balls, concerts, and assemblies of gay and genteel persons, which were correctly designed and well coloured; though their actions and attitudes were sometimes very indelicate. His pictures had a strong effect at a distance; yet when they were more nearly inspected, they showed a neatness of pencil, a spirited touch, and a good expression.

BISHOP, a prelate or person consecrated for the spiritual government and direction of a diocese. The word comes from the Saxon *bischop*, and that from the Greek *ἐπισκοπος*, an *overseer* or *inspector*: which was a title the Athenians gave to those whom they sent into the provinces subject to them, to see whether every thing were kept in order; and the Romans gave the same title to those who were inspectors and visitors of the bread and provision. It appears from a letter of Cicero, that he himself had a bishopric; being *episcopus Ora & Campaniæ*.

A bishop differs from an archbishop in the following particulars: That an archbishop with bishops consecrate a bishop as a bishop with priests ordain a priest; that the archbishop visits a province as the bishop a diocese; that the archbishop convokes a provincial synod as the bishop a diocesan one; and that the archbishop has canonical authority over all the bishops of his province as the bishop over the priests in his diocese. It is a long time since bishops have been distinguished from mere priests or presbyters; but whether that distinction be of divine or human right, whether it was settled in the apostolical age or introduced since, is much controverted. But whether the apostles settled any thing of this kind themselves, or whether they left the spiritual economy in the hands of the presbyters, or of those together with the people, it appears that in a little time the functions of the priesthood were divided, and the priests distinguished into degrees; the political part of religion being, according to some, assigned principally to bishops; and the evangelical to the priests, &c. Or, according to others, the functions of teaching and preaching were reserved to the bishop, and that of ordination superadded; which was their principal distinction, and the mark of their sovereignty in their diocese.

By the ancient discipline, bishops were to be married once, and not to put away their wives on pretence of religion; but a second marriage was a disqualification for this order. If they lived chaste, they were ranked as confessors. Some bishops, in the middle age, on account of their *regalia* or temporalities, were obliged to a military service called *hostis*, by which they were to lead their vassals into the field, and attend the king in his military expeditions. This Charlemagne excused, and even forbid: but the prohibition was little regarded; since we find the thing often practised afterwards.

The election of bishops was anciently placed in the clergy, and the people of the parish, province, or diocese; but afterwards, princes and magistrates, patriarchs

and popes, usurped the power. The election was to be within three months after the vacancy of the see; and the person to be chosen out of the clergy of that church. Formerly the bishop claimed a share in the election of an archbishop; but this was set aside by the popes.

In England, during the Saxon times, all ecclesiastical dignities were conferred by the king in parliament. At length, however, after several contests, especially between archbishop Anselm and Henry I. in consequence of a grant of King John, recognized in Magna Charta, and established by stat. 25 Edw. III. stat. 6. § 3. bishops were elected by the chapters of monks or canons, some shadow of which still remains in the present method of disposing of bishoprics; but by stat. 25 Hen. VIII. cap. 20. the right of nomination was restored to the crown.

Ordinarily at least three bishops are required in the ceremony of consecrating a bishop; but in some cases a single one might suffice. The English succession of Protestant bishops stands on this last ground. In England, the king being certified of the death of a bishop by the dean and chapter, and his leave requested to elect another, the *conge d'elire* is sent to them, with a letter missive, nominating the person whom he would have chosen. The election is to be within twelve days after the receipt of it, otherwise the king by letters patent appoints whom he pleases; and the chapter, in case of refusing the person named by the king, incurs a *præmunire*. After election, and its being accepted of the bishop, the king grants a mandate under the great seal for confirmation; which the bishop consigns to his vicar-general; consisting mostly in a solemn citation of such as have any objections to the bishop elect, a declaration of their contumacy in not appearing, and an administration of the oaths of allegiance and supremacy, of symony, and canonical obedience. Sentence being read by the vicar-general, the bishop is installed in the province of Canterbury by the arch-deacon; the fact is recorded by a public notary; and the bishop is invested with full powers to exercise all spiritual jurisdictions, though he cannot sue for his temporalities till after consecration. Then follows the consecration by the archbishop or some other bishop appointed by lawful commissions, and two assistant bishops: the ceremony of which is much the same as in the Romish church, save that having put on the episcopal robes, the archbishop and bishops lay their hands on the new prelate's head, and consecrate him with a certain form of words. The process of the translation of a bishop to another bishopric only differs in this, that there is no consecration. The age of a bishop is to be at least thirty years; and by the ancient discipline, none were to be chosen but those who had passed through all the inferior orders; but in some cases of necessity this was dispensed with, and deacons, nay laymen, were raised *per saltum* to the episcopal dignity.

The form of consecrating a bishop is different in different churches. In the Greek church, the bishop elect, being by the assistant bishops presented for consecration, and the instrument of election put in his hand; after several prayers (the first called *diaconicum*) demanding consecration, makes profession of his faith; after

Bishop.

Bishop. after which he receives a benediction. He is then interrogated as to the belief of the Trinity; to which he answers by a *long profession of faith*, and receives a second benediction. Lastly, he is asked what he thinks of the *incarnation*; to which he answers in a *third profession of faith*; which is followed by a third benediction: after which the consecrator gives him the pastoral staff: then he is led up to the altar; where, after certain prayers, and three crosses on his head, he receives the *pallium*, if he be an archbishop or patriarch; he then receives the kiss of peace of his consecrator and two assistants; and sitting down, reads, prays, and gives the communion to his consecrator and others.

In the Romish church, the bishop elect being presented by the elder assistant to the consecrator, takes the oath: he is then examined as to his faith; and after several prayers, the New Testament is drawn over his head, and he receives the chrism or unction on his head. The pastoral staff, ring, and Gospel, are then given him; and after communion, the mitre is put on his head; each ceremony being accompanied with proper prayers, &c. the consecration ends with *Te Deum*. These last mentioned ceremonies are laid aside in the consecration of English bishops. Nevertheless, the book of consecration set forth in the time of Edward VI. and confirmed by act of parliament, in which some of them are enjoined, is declared to be the standard for this purpose by the thirty-sixth article.

The function of a bishop in England may be considered as two-fold, viz. what belongs to his order, and what belongs to his jurisdiction. To the episcopal order belong the ceremonies of dedication, confirmation, and ordination; to the episcopal jurisdiction, by the statute law, belong the licensing of physicians, surgeons, and schoolmasters, the uniting small parishes (though this last privilege is now peculiar to the bishop of Norwich), assisting the civil magistrate in the execution of statutes relating to ecclesiastical matters, and compelling the payment of tithes and subsidies due from the clergy. By the common law, the bishop is to certify the judges, touching legitimate and illegitimate births and marriages; and by that and the ecclesiastical law, he is to take care of the probate of wills and granting administrations; to collate to benefices, grant institutions on the presentation of other patrons, command induction, order the collecting and preserving the profits of vacant benefices for the use of the successors, defend the liberties of the church, and visit his diocese once in three years. To the bishop also belong suspension, deprivation, deposition, degradation, and excommunication.

All bishops of England are peers of the realm, except the bishop of Man; and, as such, sit and vote in the House of Lords: they are barons in a threefold manner, viz. feudal, in regard to the temporalities annexed to their bishoprics; by writ, as being summoned by writ to parliament; and lastly, by patent and creation: accordingly they have the precedence of all other barons, and vote as barons and bishops; and claim all the privileges enjoyed by the temporal lords, excepting that they cannot be tried by their peers, because, in cases of blood, they themselves cannot pass upon the trial, for they are prohibited by the canons of the church (as already observed) to be judges of life and death. They have the title of *Lords and Right Reve-*

rend Fathers in God. Besides two archbishops, there are 24 bishops in England; exclusive of the bishops of Sodor and Man, who has no seat in the House of Peers: The bishops of London, Durham, and Winchester, take place from the other bishops, who are to rank after them according to their seniority of consecration. — There is now also a bishop in our settlement of Nova Scotia. In Scotland, before the Presbyterian establishment, there were two archbishoprics and 12 bishoprics.

BISHOP'S COURT, an ecclesiastical court, held in the cathedral of each diocese, the judge whereof is the bishop's chancellor, who judges by the civil and canon law; and if the diocese be large, he has his commissaries in remote parts, who hold what they call *consistory courts*, for matters limited to them by their commission.

BISHOP and his Clerks, some little islands and rocks on the coast of Pembrokeshire near St David's in Wales, which are very dangerous to mariners.

BISHOP'S-AUKLAND. See AUKLAND.

BISHOP'S CASTLE, a town of Shropshire in England, seated near the river Clun. It is a corporation, sends two members to parliament, and its market is much frequented by the Welch. W. Long. 2. 55. N. Lat. 52. 30.

BISHOP'S-STORTFORD, a town of Hertfordshire in England, seated on the side of a hill, in E. Long. 0. 25. N. Lat. 51. 50. It has several good inns, but the streets are not paved. It has a large church, one Presbyterian and one Quaker meeting. Here was formerly a castle called *Weymore castle*, wherein a garrison was kept, but no remains of it are now left.

BISHOPING, a term among horse-dealers, to denote the sophistications used to make an old horse appear young, a bad one good, &c.

BISHOPRIC, the district over which a bishop's jurisdiction extends, otherwise called a diocese.

In England there are 24 bishoprics besides that of Sodor and Man; in Scotland, none at all; in Ireland 18.

BISI (Bonaventura), a celebrated miniature painter, was born at Bologna, and was a disciple of Lucio Massari. But his sole delight was in miniature painting, and in that way he arrived at great excellence. Instead of working from his own invention, or original design, he employed himself to imitate, in small size, the pictures of Guido, Correggio, Titian, and other great masters, and those he finished with astonishing grace, neatness, and beauty. A great number of the works of this master are in the Duke's gallery at Modena, and are highly valued. He died in 1662, his age unknown.

BISIGNANO, a town of Italy, in the kingdom of Naples, and in the Hither Calabria. It hath a strong fort, a bishop's see, and the title of a principality. It is seated on a mountain near the river Boccona, in E. Long. 16. 40. N. Lat. 39. 37.

BISK, or **BISQUE**, in cookery, a rich sort of broth or soup, made of pigeons, chickens, force-meat, mutton-gravy, and other ingredients. The word is French, formed, as some think, from *biscotta*; because the bisque, consisting of a diversity of ingredients, needs several repeated coctions to bring it to perfection. There is also a *demi-bisque*, made at a low expence, in which only half the ingredients are used; and a bisque

Bishop
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Bisk.

Bisket
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Bismuth.

of fish, made of carps minced with their roes and lobsters.

BISKET, a kind of bread prepared by the confectioners, of fine flour, eggs, and sugar, and rose or orange water; or of flower, eggs, and sugar, with aniseeds and citron-peel, baked again and again in the oven, in tin or paper moulds. There are divers sorts of biskets; as seed-bisket, fruit-bisket, long-bisket, round-bisket, Naples-bisket, sponge-bisket, &c.

Sea-BISKET, is a sort of bread much dried by passing the oven twice, to make it keep for sea-service. For long voyages they bake it four times, and prepare it six months before the embarkation. It will hold good a whole year.

To preserve sea-bisket from insects, Mr Hales advises to make the fumes of burning brimstone pass through the casks full of bread. Bisket may be likewise preserved a long time, by keeping it in casks well calked, and lined with tin.

The ancients had their bisket prepared after the like manner, and for the like use, as the moderns. The Greeks called it *απλον διπυρον*, *q. d.* bread put twice to the fire. The Romans give it the name of *panis nauticus*, or *capta*. Pliny denominates it *vetus aut nauticus panis tusus atque iterum coctus*. By which it appears, that, after the first baking, they ground or pound it down again for a second. In some middle-aged writers, it is called *paximas*, *paximus*, and *panis paximatus*. Among the Romans we also meet with a kind of land-bisket for the camp-service, called *bucellatum*, sometimes *expeditionalis annona*, which was baked much, but to make it lighter for carriage, and less liable to corrupt, the coction being continued till the bread was reduced one-fourth of its former weight.

BISKOP. See **BISCHOP**.

BISMILLAH, a solemn form used by the Mahometans at the beginning of all their books and other writings, signifying, *In the name of the most merciful God*.

BISMILLAH is also used among the Arabs as a word of invitation to eat. An Arab prince will frequently sit down to eat in the street before his own door, and call to all that pass, even beggars, in this word, who do not fail to come and sit down to eat with him; for the Arabs are great levellers, and set every body upon a footing with them.

BISMUTH, or **TIN-GLASS**, one of the semi-metals, of a reddish or yellowish-white colour and a lamellated texture, and moderately hard and brittle, so that it not only breaks into pieces under the strokes of the hammer, but may even be beat into powder. It is the heaviest of all the semi-metals, weighing from 9.600 to 9.700, and is about as fusible as lead. It is found,

1. *Native*. Bismuth is found more commonly in a native state than any other metallic substance. It is usually crystallized in cubes or octagons, or in the form of dendrits or thin laminæ investing the ores of other metals, particularly cobalt.

2. *Native Calx of Bismuth*, in which the metal is mineralized by aerial acid, is either in form of a powder or indurated like mortar. It is frequently of a greenish-yellow colour, being mixed with the ores of other metals. The red and yellow part is most commonly cobalt ore; though it has often been mistaken for bis-

muth. It is frequently found in glittering particles interspersed through stones of various kinds. Silver, iron, and other metals, are also found in it.

3. *Mineralized by the Vitriolic Acid*. This is said to be of a yellowish, reddish, or variegated colour, and to be found mixed with the calx of bismuth incrusting other ores.

4. *By Sulphur*. This is found chiefly in Sweden, is of a bluish-grey colour, a lamellated texture and tessellar form like galena, but much heavier; sometimes presenting parallel striæ like antimony. It is said to contain cobalt and arsenic as well as bismuth. It is very fusible, and the sulphur it contains may be mostly separated by scorification.

5. *By Sulphur and Iron*. This ore is said to be of a lamellar cuneiform texture, and to be found in Norway. This kind of ore yields a fine radiated regulus; for which reason it has been ranked among the antimonial ores by those who have not taken proper care to melt from it a pure regulus, or one destitute of sulphur. In Schneeberg they have what is called *columbine* bismuth and *plumose* bismuth; the former taking its name from the colour, the latter from its texture. The latter is said to contain a great quantity of cobalt.

6. *With Sulphur and Arsenic*. This ore is generally of a whitish-yellow or ash colour, has a shining appearance, and is composed of small scales or plates intermixed with small yellow flakes. Its texture is hard and solid; sometimes it strikes fire with steel. It has a disagreeable smell when rubbed; does not effervesce with acids, but is partially dissolved by the nitrous acid. The solution, diluted with water, becomes a kind of sympathetic ink; the words written with it on white paper being invisible when dry, but assuming a yellowish colour when heated before the fire. There is also a grey bismuth ore of the arsenicated kind, with a striated form, found at Helsingland in Sweden and at Annaberg in Germany. Another of the same kind, with variegated colours of red, blue, and yellowish-grey, is likewise found at Schneeberg in Saxony. At Misnia in Germany, and at Gillebeck in Norway, it is also found striated with green fibres like an amianthus. At Georgenstadt in Germany, and at Annaberg in Saxony, it is intermixed with reddish-yellow shining particles, called by the French *Mines de Bismuth Tigreas*. The *minera bismuthi arenacea* mentioned by Wallerius and Bomare belongs also to the same kind of arsenicated ores.

This semimetal is scarcely altered by exposure to the light. In close vessels it sublimes without any alteration; and if permitted to cool slowly, it crystallizes in Greek volutes. It crystallizes also more easily than any other metallic substance. Heated with access of air, its surface, when melted, soon becomes covered with a greenish-grey or brown calx. If the metal be heated at once to ignition, it burns with a small blue flame scarcely sensible, and the calx evaporates in a yellowish smoke, which condenses into flowers of the same colour. Mr Geoffroy observed, that the flowers which rise last are of a beautiful yellow colour like orpiment. By exposure to the heat of a porcelain furnace, a part of the semimetal flowed out through a crack in the vessel, and the portion which remained in the vessel formed a glass of a dirty violet colour, while the bismuth melted in contact with the external

air

Bismuth. air was yellowish. By exposure to the atmosphere the surface of this metal becomes somewhat tarnished, and its surface covered with a whitish rust. It is not attacked by water, nor does it combine with earths; but its calces give a greenish-yellow tinge to glasses. It is employed by pewterers to communicate hardness to tin; and may be used instead of lead in the cupellation of metals. It resembles lead in many respects, and is thought to be dangerous when taken internally.

Most metallic substances unite with bismuth, and are thereby rendered more fusible than before; hence it is used in the making of solder, printers types, &c, as well as pewter. When native, it is of a yellowish-white colour, and so fusible that it melts at the flame of a candle. By calcination it gains about half an ounce in the pound. This calx is said to promote the vitrification of earths, and of the refractory metallic calces more powerfully than lead, and likewise to act as a more violent corrosive on crucibles than the glass of lead itself. Hence it is preferable to lead for the purification of gold and silver, destroying more effectually the baser metals with which they have been adulterated. In all operations of this kind, where sulphur makes one of the heterogeneous matters to be destroyed, bismuth is of the greatest service, on account of its forming with sulphur an extremely fusible compound, while that of lead and sulphur proves very refractory.

Bismuth readily amalgamates with mercury, and the compound adheres to iron. On exposing the iron, thus coated with amalgam, to a considerable heat, the mercury exhales, and the greatest part of the bismuth adheres to the iron, which thus looks as if it had been silvered. If mixtures of bismuth with some other metals, particularly lead, be amalgamated, the lead becomes so thin as to pass through leather along with the mercury; but on standing, the bismuth is thrown up to the surface in form of a dark-coloured powder, the quicksilver and lead remaining united. From this property it is too often used for the purpose of adulterating quicksilver; as rendering a very considerable portion of lead intimately combined with it. One part of this metal with another of bismuth, may be united with three of quicksilver, without affecting its fluidity. The quicksilver thus adulterated is not only unfit for medicinal uses, but even for the common mechanical purposes of gilding and silvering; as the workmen find, in this case, that it leaves a leaden hue upon the gold or silver, which spoils the fine appearance of the work. If the abuse happens to be discovered, the mercury may be purified by distillation to a certain degree, though, according to Boerhaave, it is impossible ever to free it totally from a mixture of any of the imperfect metals.

This semimetal readily unites by cementation with sulphur, and melts with a more gentle heat than when alone; but on continuing the fire, a separation takes place, the bismuth falling to the bottom, and a sulphureous scoria swimming on the surface. Sulphur is likewise very readily absorbed by the calx of bismuth. A curious needle-formed mass is the product of their union, in appearance exactly resembling antimony, but contracting a reddish tinge on the outside by exposure to the air. The calx cannot take up quite half its weight of sulphur.

Silver melts with the compound of calx of bismuth

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and sulphur in a very gentle heat into a brittle regulus. With a stronger fire gold also unites with it, forming a brittle compound, whose particles somewhat resemble an ore, with some striæ and shining ones among them. Copper melts with it in a gentle heat, and the compound retains a remarkable degree of fusibility: on the addition of lead a new combination takes place; the copper and sulphur rise to the top in scoria resembling an ore, whilst the bismuth and lead unite into a regulus at the bottom. Zinc and bismuth will not unite; the former melting and burning on the surface as it does by itself. Equal parts of lead, tin, and bismuth, form a blackish sparkling compound resembling the small dried ores of lead.

The specific gravity of a mixture of bismuth and copper is exactly the mean betwixt that of the two ingredients unmixed. With iron the compounds are specifically lighter than each of the ingredients; but with gold, silver, tin, lead, and regulus of antimony, they turn out heavier than either of the ingredients.

Bismuth reduced to powder, and applied with the white of eggs to turned wood, makes it look as if it had been silvered, after being properly dried and rubbed over with an hard polisher. Some pretend that the calx of bismuth, by long reverberation, becomes red like that of lead; but this is found to be a mistake. In this case it scarcely even retains the form of a calx; for a part of the bismuth is soon revived into its metallic state by the contact of the flame. None of the destructible metallic substances is capable of being revived so easily as bismuth. The calx heated strongly in a close vessel melts into glass.

This semimetal is most commonly lodged in cobalt ores; which, when of a high red, or peach-bloom colour, are called *bismuth bloom* or *flowers of bismuth*. It has been supposed, that bismuth communicates to glass the same blue colour with cobalt, because the dross which remains after the bismuth has been melted out, and called by the smelters *bismuth-grain*, sometimes produces that effect. But as no such grains or colouring-matter remains from pure bismuth, it is plain, that this property must depend on something mixed with the semimetal, and which was undoubtedly nothing but some cobalt-ore united with the bismuth.

To the same mixture we must ascribe the property which bismuth-ore has of making sympathetic ink of the same kind with that formed directly by solution of regulus of cobalt. For this purpose a tincture is to be drawn from the ore with aquafortis, and this afterwards mixed with a saturated solution of sea-salt, and inspissated, yields a reddish salt: its watery solution is the curious liquor called *Green Sympathetic Ink*; though there is an impropriety in calling it *green*, when in fact it is red. If any words are written with this ink on white paper, the characters disappear as soon as dry; but on holding the paper to the fire, they become *green* and legible: on cooling they disappear again, and this repeatedly any number of times. Bomare informs us, that words written with this sympathetic ink may also be rendered legible, by wetting them with a sponge or pencil dipped in an aqueous solution of *hepar sulphuris*. The experiments succeed best when the tincture drawn from the calcined ore is mixed with a solution of one-fourth its weight of sea-salt: this mixture is then evaporated

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nearly

Bismuth.

Bisnagar.

nearly to dryness, and the residuum dissolved in water, which is then the sympathetic ink. If the tincture be mixed with nitre or borax instead of sea-salt, the characters will become rose-coloured when warmed; and by passing sea-salt over them they afterwards become blue; but if mixed with as much alkali as is sufficient to saturate the acid, they change by heat to a purple and red colour. See CHEMISTRY-Index.

BISNAGAR, formerly a very large and powerful kingdom of Asia, comprehending the kingdoms of Kanara, Messowr, Travankor, Madura, Marava, and Tanjour. It was called *Bisnagar* from its capital city, and took the name of *Narsinga* from one of its rajahs or kings. We know nothing certain concerning this kingdom before the year 1520, when Khrisna Rajah, king of Bisnagar, made war with Adel Khan king of Vissapur, from whom he resolved to take the city of Rachol, situated in the island of Salsette near Goa, which he said had belonged to his ancestors. The king of Bisnagar's army consisted of 733,000 foot, 35,000 horse, 586 elephants with towers on their backs, each of which had four men in it; besides these were 12,000 water-carriers, and the army was followed by 20,000 common women. The city, however, resisted this formidable army for three months; at the end of which, Adel Khan came to its relief with an army of 120,000 foot, 18,000 horse, 150 elephants, and many heavy cannon. In the engagement the king of Bisnagar proved victorious, and almost entirely destroyed the army of Adel Khan, taking from him 4000 horses, 100 elephants, 400 cannon, &c. Soon after he took the city by assault; but consented to restore the booty taken in the former battle, provided Adel Khan consented to come and kiss his foot as the sovereign lord of Kanara. This base condition was accepted, but accidentally prevented from being put in execution. From this time we hear of nothing remarkable till the year 1558, when a Portuguese of the city of *Meliapur* or *St Thomas*, on the coast of Coromandel, persuaded Rama Rajah, then king of Bisnagar, to march against that place, telling him the plunder would be worth 2,000,000, and that the destruction of Meliapur would be of great service to the images in the Pagods which were thrown down by the Christians. The king set out accordingly with an army of 500,000 men; but the inhabitants, instead of preparing for their defence, sent him a present of 4000 ducats. This somewhat appeased him; however, he would not enter the city, but ordered the inhabitants of both sexes, with all their valuable effects, to be brought into his presence; which being done, he found that the value of their whole substance did not exceed 80,000 ducats. On this he ordered the informer to be thrown to the elephants, who tore him in pieces; after which he dismissed the citizens, and restored all their goods so punctually, that only a silver spoon happening to be missing, it was sought for, and returned to the owner. In 1565, the happy state of this kingdom excited the envy of the kings of Dekan; who, having raised an army of 500,000 foot and 50,000 horse, defeated and killed the king of Bisnagar, though at the head of an army almost twice as numerous, and took the royal city itself. They are said to have spent five months in plundering it, although the inhabitants had before carried off 1550 elephants loaded with money and jewels to the amount of upwards

of 100,000,000 of gold; besides the royal-chair for state days, whose price could not be estimated. The victors, however, found a diamond of the size of an ordinary egg, besides another of a size somewhat inferior, and several other jewels of immense value. Afterwards, however, they were forced to abandon the kingdom, as being too large for them to keep in their hands. From this time the kingdom of Bisnagar remained pretty much unmolested till about the year 1627, when it was subdued by Aurengzebe, second son to Shah Jahan, and hath ever since remained subject to the Great Mogul. In some places of this kingdom it is said the roads have great forests of bamboos on each side, which are so thick that it is impossible for a man to pass. These forests are full of monkeys; and what is singular, those on the one side seem to be enemies to those on the other; for if a basket of rice is set down on the road with a parcel of small sticks about it, the monkeys on each side will come out and fall a-fighting with the sticks till one of the parties retreats. This, it is said, is often done by travellers for diversion. They catch the wild elephants here in pitfalls, and then tame them by means of others already tamed: the latter seldom fail of beating the wild ones into a good behaviour. The town of Bisnagar is situated in E. Long. 78. 0. N. Lat. 13. 20.

BISNOW, or BISCHNOU, a sect of the Banians in the East Indies; they call their god Ram-ram, and give him a wife: They adorn his image with golden chains, necklaces of pearls, and all sorts of precious stones. They sing hymns in honour of their god, mixing their devotion with dances and the sound of drums, flagelets, brazen basons, and other instruments. This sect lives wholly upon herbs and pulse, butter and milk. In this sect, the wives do not burn themselves after their husbands death, as is practised by those of the *samarath* sect; but content themselves with a perpetual widowhood.

BISOMUM, or DISOMUM, in Roman antiquity, a tomb for two dead bodies, or the ashes of two. The ancients frequently buried two, three, or four bodies in the same sepulchre, disposed aside of each other: for it was held an impiety to lay one a-top of another. Hence the sepulchres of the primitive Christians had the words *bisomi*, *trisomi*, *quadrisomi*, &c. inscribed on them to indicate the number of bodies deposited in them.

BISON, in zoology, the trivial name of a species of bos. See Bos.

BISQUET, or BISKET. See BISKET.

BISSAGOS, a cluster of islands on the coast of Negroeland in Africa, situated between the mouth of the river Gambia and Rio Grande. Their names are, *Bulam*, *Cassuabac*, *La Gallinci*, *Cazegut*, *Calacha*, and *Oranguana*, with some other small islands; but the only one which merits a particular description is that of *Bulam*. Each of these islands is governed by a king of its own; and as all those petty monarchs are quite independent, they frequently make war with each other, yet they always unite against the inhabitants of *Biafara*, who are their common enemies. They have canoes that carry from 25 to 40 men with their provisions and arms, which are sabres, and bows and arrows. The inhabitants are negroes; who are tall, strong, and healthy, though they live only on fish, nuts, and palms.

Bisnow

Bissagos.

Bissao.

palm-oil; choosing rather to sell the rice, mullet, and other grain produced in their country, to the Europeans, than not to gratify their passion for trinkets and ornaments. In general, they are idolaters; cruel and savage in their disposition, not only to strangers but to one another, when they happen to quarrel, as they frequently do about trifles; and if they happen to be disappointed of their revenge, they frequently drown or stab themselves.

BISSAO, an island on the coast of Africa, a few leagues to the south-east of the river Gambia, and separated from the continent only by the channel of the river Geves. In this island the French have a factory, and there is also a fort belonging to the Portuguese, at both of which a great trade is carried on. The island is about 35 or 40 miles in circumference, having an agreeable prospect to the sea, from which it rises by a gentle ascent on every side to an eminence in the centre of the island. There are however a great many hills inferior in height to that in the middle, and separated by beautiful and fertile valleys divided by little rivulets, which at the same time augment the richness and elegance of the scene. So rich is the soil of Bissao, that wheat and maize spring up to the size of Indian corn, or rather resemble a field covered over with reeds or bamboos. The cattle also are of an extraordinary size, and seem to keep pace with the extravagant growth of the corn. Milk and wine are in the greatest abundance; but the island affords neither hogs nor horses. The former are forbid by the natives to be imported; and something in the soil or climate renders it unfit for the increase of the latter, which never thrive here. The dress of the men of all ranks in Bissao is only a skin fixed to the girdle before and behind. The dress of the married women consists of a cotton petticoat; but virgins go entirely naked, wearing only bracelets of different kinds on their arms and legs. If they are of high quality, their bodies are marked or painted with a variety of hideous forms of snakes and other figures, which as their colour is jet-black, gives their skins somewhat the appearance of flowered sattin. Even the princess royal herself, the eldest daughter of the emperor, is only distinguished from other women by the elegance of those paintings and the richness of her bracelets. One very extraordinary ornament used in this country is a large iron ring with a flat round surface on the outside instead of a stone, upon which the ring changes with a bit of iron, in such a manner as to converse with the greatest facility by means of the different sounds produced; but this kind of language is used only among the polite and the great. All the Bissaons are idolaters, nor has commerce introduced the smallest change in their manners, but their ideas of religion are exceedingly confused. Their chief idol is a little image called *China*, of which the worshippers give very absurd accounts; but, besides this, every man invents a god for himself: trees are held sacred; and if not adored as gods, are worshipped as the residence of some divinity. The government is despotic, the will of the emperor being a law to his people. Of this we have an instance in Bissao, not to be matched in any other country whatever. This is no other than a present which one subject may make of the house and estate of his neighbour to the emperor; and as it is most commonly

his majesty's pleasure to accept of such presents, the proprietor dares not resist, but immediately sets about building another house, though even this he cannot do without the prince's leave; and if this should not be readily granted, he must live with his family in the open air till permission to build a new house can be obtained.

BISSAT (Peter), professor of canon law in the university of Bononia in Italy, was descended from the earls of Fife in Scotland, and born in that county in the reign of James V. He was educated at St Andrew's: from thence he removed to Paris; and, having spent some time in that university, proceeded to Bononia, where he commenced doctor of laws, and was afterwards appointed professor of canon law. He continued in that honourable employment several years with great reputation, and died in the year 1568. He is said to have been not only a learned civilian, but an excellent poet, orator, and philosopher. *Patricii Bissarti opera omnia, viz. poemata, orationes, lectiones feriales, &c. Lib. de irregularitate, &c.* were published at Venice in 1565, 4to.

BISSENPOUR, a small district of the kingdom of Bengal in the East Indies, which has all along preserved its independence. It has been governed time immemorial by a Bramin family of the tribe of Rajahputs. Here the purity and equity of the ancient political system of the Indians is found unadulterated. This singular government, the finest and most striking monument in the world, has till now been beheld with too much indifference. We have no remains of ancient nations but brass and marble, which speak only to imagination and conjecture, those uncertain interpreters of manners and customs that no longer exist. Were a philosopher transported to Bissenpour, he would immediately be a witness of the life led by the first inhabitants of India many thousand years ago; he would converse with them: he would trace the progress of this nation, celebrated as it were from its very infancy; he would see the rise of a government which, being founded in happy prejudices, in a simplicity and purity of manners, in the mild temper of the people, and the integrity of the chieftains, has survived those innumerable systems of legislation, which have made only a transitory appearance in the stage of the world with the generations they were designed to torment. More solid and durable than those political structures, which raised by imposture and enthusiasm, are the scourges of human kind, and are doomed to perish with the foolish opinions that gave them birth, the government of Bissenpour, the offspring of a just attention to order and the laws of nature, has been established and maintained upon unchangeable principles, and has undergone no more alteration than those principles themselves. The singular situation of this country has preserved to the inhabitants their primitive happiness and the gentleness of their character, by securing them from the danger of being conquered, or of imbruing their hands in the blood of their fellow-creatures. Nature has surrounded them with water; and they need only open the sluices of their rivers to overflow the whole country. The armies sent to subdue them have so frequently been drowned, that the plan of enslaving them has been laid aside; and the projectors of it have thought proper to content themselves with an appearance of submission.

Bissat,
Bissenpour.

Bisextile
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Bistre.

Liberty and property are sacred in Bissenpour. Robbery, either public or private, is never heard of. As soon as any stranger enters the territory, he comes under the protection of the laws, which provide for his security. He is furnished with guides at free cost, who conduct him from place to place, and are answerable for his person and effects. When he changes his conductors, the new ones deliver to those they relieve an attestation of their conduct, which is registered and afterwards sent to the Raja. All the time he remains in the country, he is maintained and conveyed with his merchandise at the expence of the state, unless he desires leave to stay longer than three days in the same place. In that case, he is obliged to defray his own expences; unless he is detained by any disorder, or other unavoidable accident. This beneficence to strangers is the consequence of the warmth with which the citizens enter into each others interests. They are so far from being guilty of an injury to each other, that whoever finds a purse, or other thing of value, hangs it upon the first tree he meets with, and informs the nearest guard, who give notice of it to the public by beat of drum. These maxims of probity are so generally received, that they direct even the operations of government. Out of about 350,000 l. on an average it annually receives, without injury to agriculture or trade, what is not wanted to supply the unavoidable expences of the state, is laid out in improvements. The Raja is enabled to engage in these humane employments, as he pays the Moguls only what tribute and at what times he thinks proper.

BISSEXTILE, in chronology, a year consisting of 366 days, being the same with our leap-year. See **CHRONOLOGY**.

BISTI, in commerce, a small coin of Persia: Some say that it is among the current silver coins of Persia, and worth only a little above three farthings of our money; others speak of it again as a money of account.

BISTONIS, (anc. geog.), a lake of Thrace near Abdera, on which dwelt the Bistones: hence *Bistonius Tyrannus* is by Lucan used to denote Diomedes king of Thrace, who fed his horses with human flesh; and *Bistonius turbo*, a wind blowing from Thrace.

BISTORT, or **KNOTGRASS**, in botany, the trivial name of a species of polygonum. See **POLYGONUM**.

BISTOURY, in surgery, an instrument for making incisions; of which there are different kinds, some being of the form of a lancet, others straight and fixed in the handle like a knife, and others crooked with the sharp edge on the inside.

BISTRE, among painters, signifies the burnt oil extracted from the foot of wood.

It is of a brown transparent colour, having much the same effect in water-painting, where alone it is used, as brown pink in oil. Though this colour is extremely serviceable in water colours, and much valued by those who know and can procure it; yet it is not in general use here, perhaps on account of its not being easily procured of a perfect kind; hardly any of it being good, except that imported from France. Perhaps the principal reason for this is, that dry beech-wood affords the best foot for making it: and it is not easy to procure such here without mixture of the foot of green wood, or other combustibles that deprave it for

this purpose: or it is possible that they who have pretended to prepare it, have been ignorant of the proper means; there not being any recipe or directions in books that treat of these matters, from whence they could learn the proper process.

Bistre may, however, be prepared with great ease in the following manner.—Take any quantity of foot of dry wood, but let it be of beech wherever that can be procured. Put it into water in the proportion of two pounds to a gallon; and boil them half an hour: then after the fluid has stood some little time to settle, but while yet hot, pour off the clearer part from the earthy sediment at the bottom; and if on standing longer it forms another earthy sediment, repeat the same method, but this should be done only while the fluid remains hot: evaporate then the fluid to dryness: and what remains will be good bistre, if the foot was of a proper kind.—The goodness of bistre may be perceived by its warm deep brown colour, and transparency when moistened with water.

BISTRICZ, a handsome strong town of Transylvania, seated on a river of the same name, in E. Long. 25. 3. N. Lat. 47. 33.

BIT, or **BITT**, an essential part of a bridle. Its kinds are various. 1. The musrol, snaffle, or watering-bit. 2. The canon-mouth, jointed in the middle. 3. The canon with a fast mouth, all of a piece, only kneed in the middle, to form a liberty or space for the tongue; fit for horses too sensible, or ticklish, and liable to be continually bearing on the hand. 4. The canon-mouth, with the liberty in form of a pigeon's neck; proper where a horse has too large a tongue. 5. The cannon with a port mouth, and an upset or mounting liberty; where a horse has a good mouth, but large tongue. 6. The scatch-mouth, with an upset; ruder but more secure than a cannon mouth. 7. The cannon mouth with a liberty; proper for a horse with a large tongue, and round bars. 8. The masticadour, or slaving bit, &c. The several parts of a snaffle, or curb-bit, are the mouth piece, the cheeks and eyes, guard of the cheek, head of the cheeks, the port, the welts, the campanel or curb and hook, the bosses, the bolsters and rabbits, the water-chains, the side-bolts, and rings, kirbles of the bit or curb, trench, top-rol, flap and jieve. The importation of bits for bridles is now prohibited.

BIT, or *Bitts*, in ship-building, the name of two great timbers, usually placed abaft the manger, in the ship's loof, through which the cross-piece goes: The use of it is to belay the cable thereto while the ship is at anchor.

BIT is also used in commerce for a piece of coin current in Jamaica, and valued at 7½d.

BITBURGH, a town of the Netherlands, in the duchy of Luxemburg. E. Long. 6. 43. N. Lat. 50. 0.

BITCH, the female of the dog kind. See **CANIS**.

BITCHE, a town of Lorrain, capital of a territory of the same name, and seated at the foot of the mountains near the river Swolbe. E. Long. 7. 44. N. Lat. 49. 5.

BITETO, a town of Italy, in the kingdom of Naples, and in the Terra di Barri. E. Long. 16. 56. N. Lat. 41. 8.

BITHYNIA, an ancient kingdom of Asia, formerly known by the names of *Mysia*, *Mygdonia*, *Babrycia*, *Mariandynia*,

Bistricz
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Bithynia.

Bitonto || **Bixa.** *Mariandynia*, and *Bithynia*. It was bounded on the west by the Bosphorus Thracicus and part of the Propontis, on the south by the river Rhyndacus and mount Olympus, on the north by the Euxine sea, and on the east by the river Parthenius. The chief cities were *Myrlea*, *Nicomedia*, *Chalcedon*, *Heraclea*, and *Prusa*. —As to its history, we find nothing of moment recorded; except the famous conduct of Prusias, one of its kings, in delivering up to the Romans Hannibal, the great Carthaginian general, who fled to him for protection. His great grandson Nicomedes IV. bequeathed the kingdom to the Romans. From them it was taken by the Turks, to whom it still remains subject, but has no modern name.

BITONTO, an episcopal town of Italy, in the kingdom of Naples and Terra di Bari. It is seated in a plain eight miles south of the gulph of Venice, in E. Long. 16. 52. N. Lat. 41. 13.

BITTACLE. See **BINACLE**.

BITTER, an epithet given to all bodies of an opposite taste to sweetness. For the medical virtues of bitters, see **MATERIA MEDICA**.

BITTER, a sea-term, signifying any turn of the cable about the bits, so as that the cable may be let out by little and little. And when a ship is stopped by a cable, she is said to be brought up by a bitter. Also that end of the cable which is wound about the bits is called the bitter end of the cable.

BITTER-Apple, in botany. See **COLCYNTHIS**.

BITTER-Salt. See **EPSOM-Salt**.

BITTER-Sweet, in botany. See **SOLANUM**.

BITTERN, in ornithology. See **ARDEA**.

BITTERN, in the salt works, the brine remaining after the salt is concentered: this they laddle off, that the salt may be taken out of the pan, and afterwards put in again; when, being farther boiled, it yields more salt. See **SALT**.

BITUMENS, in natural history, are oily matters, of a strong smell, and of different consistencies, which are found in many places within the earth. See **CHEMISTRY**, *Index*.

BITUMEN JUDAICUM. See **ASPHALTUM**.

BITUREX, **BITURIGES**, or *Biturica*, afterwards corrupted to *Bourges*; the name of *Avaricum*, from the custom of the lower age of calling towns from the names of the people. See **AVARICUM**.

BITURIGES (*Cæsar*); *Bituriges Cubi* (*Strabo*, *Pliny*, *Ptolemy*); a people in that part of Gallia Celtica afterwards assigned to Aquitania. Now called *Berry*.

BITURIGES Vibisci (*Ptolemy*), a people of Aquitain.

BIVALVES, a term sometimes used for such shells as consist of two pieces. —It is also an appellation given by botanists to such pods or capsules as consist of two valves inclosing the seeds.

BIVENTER, in anatomy, called also *digastric*, or *two-bellied*, a muscle of the lower jaw. See **ANATOMY**, *Table of the Muscles*.

BIUMBRES, in geography, an appellation given to the inhabitants of the torrid zone, by reason, at two different seasons of the year, their shadows are projected two different ways. The biumbres are the same with those otherwise denominated *amphiscii*.

BIXA, the *Roucou* or *Arnotto-Tree*: A genus of

the Monogynia order, belonging to the polyandria class of plants; and in the natural method ranking under the 37th order, *Columnifera*. The corolla is ten-petaled; the calyx quinque-dentate; the capsule hispid and bivalved. Of this genus there is but one species known, viz. the orellana, a native of the warm parts of America. This rises with an upright stem to the height of eight or ten feet, sending out many branches at the top forming a regular head, garnished with heart-shaped leaves ending in a point, and having long footstalks. The flowers are produced in loose panicles at the end of the branches: these are of a pale peach colour, having large petals, and a great number of bristly stamina of the same colour in the centre. After the flower is past, the germen becomes a heart-shaped, or rather a mire-shaped, vessel, and covered on the outside with bristles opening with two valves, and filled with angular seeds. These seeds are covered with a red waxen pulp or pellicle, from which the colour called **ANOTTA** is prepared, according to the process described under that article. These plants, in the countries where they grow, thrive best in a cool rich soil, and shoot most luxuriantly near springs and rivelets. With us, they may be propagated by seeds procured from America. These are to be sown in pots in the spring, and plunged in a bed of tanner's bark: the plants must afterwards be removed into separate pots, and always kept in the stove.

BIZARRE, denoting *capricious*, &c. a term used among florists for a particular kind of carnation, which has its flowers striped or variegated with three or four colours.

BIZARRO, in the Italian music, denotes a fanciful kind of composition, sometimes fast, slow, soft, strong, &c. according to the fancy of the composer.

BIZOCHI, or *Bisochi*, in church-history, certain heretical monks, said to have assumed the religious habit contrary to the canons, rejected the sacraments, and maintained other errors.

BLACK, a well known colour, supposed to be owing to the absence of light, most of the rays falling upon black substances being not reflected but absorbed by them. Concerning the peculiar structure of such bodies as fits them for appearing of this or that particular colour, see the article **COLOUR**.

Concerning black colours in general, we have the following remarks by Dr Lewis.

"1. Of black, as of other colours, there are many shades or varieties; different bodies, truly and simply black, or which have no sensible admixture of any of the rest of the colours, as black velvet, fine black cloth, the feathers of the raven, &c. appearing, when placed together, of tints very sensibly different.

"2. One and the same body also assumes different degrees of blackness, according to the disposition of the sensible part of its surface; and in this respect, there is not, perhaps, any other colour which is so much affected by an apparent mechanism. Thus black velvet, when the pile is raised, appears intensely black, much more so than the silk it was made from; but on pressing the pile smooth, it looks pale, and in certain positions shows somewhat even of a whitish cast.

"3. This observation is agreeable to the physical theory, which ascribes the blackness of bodies to the luminous

Bixa
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Black.

Black.

luminous rays, that fall upon them, being in great part absorbed or stifled in their pores. When the surface is composed of a multitude of loose filaments, or small points, with the extremities turned towards the eye, much of the light is stifled in the interstices between them, and the body appears dark: when the filaments are pressed close, or the surface smoothed and polished, more of the light is reflected from it, and the intensity of the blackness is diminished; though the beauty may be improved by the glossiness which results from the smoothing.

“ 4. There is one case, however, in which a high polish may, on the same principle, produce blackness, in bodies otherwise even white. We find that specula of white metal, or of quicksilvered glass, which reflect the rays of light to one point or in one direction, look always dark, unless when the eye is directly opposed to the reflected rays.

“ 5. As the absorption of the luminous rays, except in the case just mentioned, makes the physical cause of blackness; it is concluded that black bodies receive heat more freely than others. Black marble or tiles, exposed to the sun, become sensibly hotter than white ones. Black paper is kindled by a burning glass much sooner than white, and the difference is strongly marked: a burning-glass, too weak to have any visible effect at all upon white paper, shall readily kindle the same paper rubbed over with ink. Hence black cloths when wetted, are said to dry faster; black habits, and rooms hung with black, to be warmer; black mould to be a hotter soil for vegetables; and garden walls, painted black, to answer better for the ripening of wall-fruit than those of lighter colours.

“ 6. It is not, however, to be affirmed that the like differences obtain in the impressions made by common fire. Black paper, held to the fire, does not seem to be affected sooner, or in a greater degree, than such as is white. It may be proper to observe also, that the combustibility of the paper may be increased, by impregnating it with substances of themselves not combustible, and which give no colour to it. This is the foundation of one of the *sympathetic inks*, as they are called, made of a strong solution of sal ammoniac in water, which, though colourless when written with on paper, becomes very legible on exposing the paper to the fire; that is, it occasions the parts moistened with it to scorch or burn, before the rest of the paper is hurt, to a brown or black. All the salts I have tried produced this effect in a greater or less degree; nitre, alum, tartar, very weakly; sea-salt more strongly; fixed alkaline salts still more so; sal ammoniac the most strongly of all. Metallic solutions, made in acids, and diluted so as not to corrode the paper, acted in the same manner.

“ 7. Besides the simple blacks, there are a multitude of compound ones, inclining more or less to other colours. Thus the painters have blue-blacks, brown-blacks, &c. which may be made by mixing pigments of the respective colours with simple black ones, in greater or less quantity, according to the shade required. The dyers also have different blacks, and often darken other colours by slightly passing them through the black dying liquor; but the term *brown-black* is in this business unknown, brown and black being here looked upon as opposite to one another. In effect,

the colour called *brown-black* is no other than that which ill-died black clothes change to in wearing: no wonder then that it is excluded from the catalogue of the dyers colours.

“ 8. The true or simple blacks, mixed with white, form different shades of grey, lighter or darker according as the white or black ingredients prevails in the mixt. The black pigments, spread thin upon a white ground, have a like effect.

“ 9. Hence the painter, with one true black pigment, can produce on white paper, or on other white bodies, all the shades of grey and black, from the slightest discoloration of the paper up to a full black: and the dyer produces the same effect on white wool, silk, or cloth, by continuing the subjects for a shorter or longer time in the black bath, or making the bath itself weaker or stronger.

“ 10. Hence also the dilution of black pigments with white, or the spreading of them thin upon a white ground, affords a ready method of judging of the quality or species of the colour; which, if it be a true black, will in this diluted state look of a pure or simple grey; but if it has a tendency to any other colour, that colour will now betray itself.

“ 11. All the colours in a very deep or concentrated state approach to blackness. Thus the red liquor prepared by boiling or infusing madder-root in water, and the yellow decoction or infusion of liquorice-root, evaporated in a gentle heat till they become thick, look of a dark black colour, or of a colour approaching to blackness; and these thick masses, drawn out into slender strings, or diluted with water, or rubbed on paper, exhibit again the red and yellow colours, which the liquors had at first. Nature affords many black objects, whose blackness depends upon the same principle, being truly a concentration of some of the other colours. Thus in black-berries, currants, elder-berries, &c. what seems to be black is no other than an opaque deep red: their juice appears black when its surface is looked down upon in an opaque vessel, but red when diluted or spread thin. The black flint, as it is called, of the island of Ascension, held in thin pieces between the eye and the light, appears greenish; and one of the deep black stones called *black agate*, viewed in the same manner, discovers its true colour to be a deep red.

The most remarkable black colours in the mineral kingdom are, *Black CHALK*, *Pit-COAL*, *Black SANDS*, and *Black LEAD* (see these articles).—The only native vegetable black is the juice of the anacardium orientale, which possibly may be the tree that produces the excellent black varnish of China and Japan (see *VARNISH*).—The juices of most astringent vegetables produce a black with iron, and for this purpose some of them are used in dyeing and callico-printing (see the article *DYEING*).—There are also a number of black colours artificially prepared for the use of painters, such as lamp-black, ivory-black, German-black, &c. for an account of the preparation and qualities of which, see the article *COLOUR-Making*.

BLACK-ART; the statute of 9 Geo. I. c. 22. is commonly called the *Waltham black act*, because it was occasioned by the devastations committed near Waltham in Essex, by persons in disguise, or with their faces blacked. By this statute it is enacted, that persons hunting armed and disguised, and killing or stealing deer, or robbing

Black.

Black. robbing warrens, or stealing fish out of any river, &c. or any persons unlawfully hunting in his majesty's forests, &c. or breaking down the head of any fish-pond, or killing, &c. of cattle, or cutting down trees, or setting fire to house, barn, or wood, or shooting at any person, or sending letters either anonymous or signed with a fictitious name demanding money, &c. or rescuing such offenders, are guilty of felony, without benefit of clergy. This act is made perpetual by 31 Geo. II. c. 42.

BLACK-Bird, in ornithology. See **TURDUS**.

BLACK-Book of the Exchequer. See **EXCHEQUER**.

BLACK-Books, a name given to those which treat of necromancy, or, as some call it, *negromancy*. The black-book of the English monasteries was a detail of the scandalous enormities practised in religious houses, compiled by order of the visitors under king Hen. VIII. to blacken, and thus hasten their dissolution.

BLACK-Cap, in ornithology. See **MOTACILLA**.

BLACK-Cock. See **TETRAO**.

BLACK-Eagle. See **FALCO**.

BLACK-Eunuchs, in the customs of eastern nations, are Ethiopians castrated, to whom their princes commonly commit the care of their women. See **EUNUCH**.

BLACK-Forest, a forest of Germany, in Suabia, running from north to south between Orttau, Brisgau, part of the duchy of Wirtemberg, the principality of Fustemburg towards the source of the Danube, as far as the Rhine above Basil. It is part of the ancient Hyrcanian forest.

BLACK-Friars, a name given to the Dominican order; called also *predicants* and *preaching friars*; in France, *jacobins*.

BLACK-Jack, or *Blend*, is a mineral called also *false galena*, *blinde*, &c. See **BLINDE**.

BLACK-Land, in agriculture, a term by which the husbandmen denote a particular sort of clayey soil, which, however, they know more by its other properties than by its colour, which is rarely any thing like a true black, and often but a pale grey. This, however pale when dry, always blackens by means of rains, and when ploughed up at these seasons it sticks to the ploughshares, and the more it is wrought the muddier and duskier coloured it appears. This sort of soil always contains a large quantity of sand, and usually a great number of small white stones.

BLACK-Lead (Plumbago). See **Black-LEAD**.

BLACK-Leather, is that which has passed the curriers hands, where, from the russet as it was left by the tanners, it is become black, by having been scored and rubbed three times on the grain-side with coperas-water. See **LEATHER**.

BLACK-Legs, a name given in Leicestershire to a disease frequent among calves and sheep. It is a kind of jelly which settles in their legs, and often in the neck, between the skin and flesh.

BLACK-Mail, a certain rate of money, corn, cattle, or other matter, anciently paid by the inhabitants of towns in Westmoreland, Cumberland, Northumberland, and Durham, to divers persons inhabiting on or near the borders, being men of name, and allied with others in those parts, known to be great robbers and spoil-takers; in order to be by them freed and protected from any pillage. Prohibited by 43 El. c. 13. The origin of this word is much contested, yet there

is ground to hold the word *black* to be here a corruption of blank or white, and consequently to signify a rent paid in a small copper coin called *blanks*. This may receive some light from a phrase still used in Picardy, where speaking of a person who has not a single halfpenny, they say, *il n' a pas une blanche maille*.

BLACK-Monks, a denomination given to the Benedictines, called in Latin *nigri monachi*, or *nigro monachi*; sometimes *ordo nigrorum*, "the order of blacks."

BLACK-Oats. See **OATS**.

BLACK-Procession, in ecclesiastical writers, that which is made in black habits, and with black ensigns and ornaments. See **PROCESSION**. Anciently at Malta there was a black procession every Friday, where the whole clergy walked with their faces covered with a black veil.

BLACK-Rents, the same with black-mail, supposed to be rents formerly paid in provisions and flesh, not in specie.

BLACK-Rod. See **ROD**.

BLACK-Row Grains, a species of iron-stone or ore found in the mines about Dudley in Staffordshire.

BLACK-Sea. See **EUXINE-Sea**.

BLACK-Sheep, in the Oriental history, the ensign or standard of a race of Turkmans settled in Armenia and Mesopotamia; hence called the *dynasty of the black sheep*.

BLACK-Stones and Gems, according to Dr Woodward, owe their colour to a mixture of tin in their composition.

BLACK-Strakes, a range of planks immediately above the wales in a ship's side. They are always covered with a mixture of tar and lamp-black.

BLACK-Tin, in mineralogy, a denomination given to the tin-ore when dressed, stamped, and washed ready for the blowing-house, or to be melted into metal. It is prepared into this state by means of beating and washing; and when it has passed through several buddles or washing-troughs, it is taken up in form of a black powder, like fine sand, called *black-tin*.

BLACK-Wadd, in mineralogy, a kind of ore of manganese, remarkable for its property of taking fire when mixed with linseed-oil in a certain proportion. It is found in Derbyshire, and is used as a drying ingredient in paints; for when ground with a large quantity of oily matter it loses the property above mentioned. See **MANGANESE**.

BLACK-Water, the name of two rivers in Ireland; one of which runs through the counties of Cork and Waterford, and falls into Yougal Bay; and the other, after watering the county of Armagh, falls into Lough-Neah.

BLACK-Whytlof, in our old writers, bread of a middle fineness betwixt white and brown, called in some parts *ravel-bread*. In religious houses, it was the bread made for ordinary guests, and distinguished from their household loaf, or *panis conventualis*, which was pure manchet, or white bread.

BLACK-Work, iron wrought by the blacksmith; thus called by way of opposition to that wrought by white-smiths.

BLACKALL (Dr Offspring), bishop of Exeter in the beginning of the 18th century, was born at London 1654, and educated at Catharine-Hall, Cambridge. For two years he refused to take the oath of allegiance.

Black.
Blackall.

Blackbank || allegiance to King William and Queen Mary, but at last submitted to the government, though he seemed to condemn the Revolution, and all that had been done pursuant to it. He was a man of great piety, had much primitive simplicity and integrity, and a constant evenness of mind. In a sermon before the house of commons, Jan. 30th 1699, he animadverted on Toland's assertion in his *Life of Milton*, that Charles I. was not the writer of the *Icon Basilike*, and for some insinuations against the authenticity of the Holy Scriptures; which produced a controversy between him and that author. In 1700, he preached a course of sermons in St Paul's at Boyle's lecture, which were afterwards published; and was consecrated bishop of Exeter in 1707. He died at Exeter in 1716, and was interred in the cathedral there.

BLACKBANK, a town of Ireland, in the county of Armagh and province of Ulster, seated in W. Long. 6. 55. N. Lat. 54. 12.

BLACKBERRY, in botany. See *RUBUS*.

BLACKBURN, a town of Lancashire in England, seated near the river Derwent. It takes its name from the brook Blackwater which runs through it. W. Long. 2. 15. N. Lat. 53. 40.

BLACKING is sometimes used for a factitious black; as lamp-black, shoe-black, &c. A mixture of ivory or lamp-black with linseed-oil makes the common oil blacking. For a shining blacking, small-beer or water is used instead of oil, in the proportion of about a pint to an ounce of the ivory-black, with the addition of half an ounce of brown sugar, and as much gum arabic. The white of an egg substituted for the gum makes the black more shining; but is supposed to hurt the leather, and make it apt to crack.

BLACKMORE (Sir Richard), a physician, and voluminous writer of theological, poetical, and physical works. Having declared himself early in favour of the Revolution, King William, in 1697, chose him one of his physicians in ordinary, and conferred the honour of knighthood on him. On Queen Anne's accession, Sir Richard was also appointed one of her physicians, and continued so for some time. Dryden and Pope treated the poetical performances of Blackmore with great contempt; and in a note to the mention made of him in the *Dunciad*, we are informed that his "indefatigable muse produced no less than six epic poems: *Prince and King Arthur*, 20 books; *Elixa*, 10; *Alfred*, 12; *The Redeemer*, 6: beside *Job*, in folio; the whole book of *Psalms*; *The Creation*, seven books; *Nature of Man*, three books; and many more." But notwithstanding Blackmore was much ridiculed by the wits, he is not without merit; and Addison has, in the *Spectator*, bestowed some liberal commendations on his poem on the Creation. It must be mentioned too in honour of Sir Richard, that he was a chaste writer, and a warm advocate for virtue, at a time when an almost universal degeneracy prevailed. He had been very free in his censures on the libertine writers of his age; and it was owing to some liberty he had taken of this kind, that he drew upon him the resentment of Mr Dryden. He had likewise given offence to Mr Pope; for having been informed by Mr Curl that he was the author of a travestie on the first Psalm, he took occasion to reprehend him for it in his *Essay on Polite Learning*. Besides what are above men-

tioned, Sir Richard wrote some theological tracts, and several treatises on the plague, small-pox, consumptions, the spleen, gout, dropsy, &c. and many other poetical pieces. He died October 9. 1729.

BLACKNESS, the quality of a black body; or a colour arising from such a texture and situation of the superficial parts of the body as does, as it were, deaden, or rather absorb, the light falling on it, without reflecting any, or very little of it, to the eye.—In which sense, *blackness* stands directly opposed to *whiteness*; which consists in such a texture of parts as indifferently reflects all the rays thrown upon it, of what colour soever they be.

Descartes, says Dr Priestly, though mistaken with respect to the nature of light and colours, yet distinguishes justly between black and white; observing, that black suffocates and extinguishes the light that falls upon it, but that white reflects them. See *BLACK*.

BLACKS, in physiology. See *NEGROES*.

BLACKS, is also a name given to an association of disorderly and ill-designing persons, formerly herding chiefly about Waltham in Essex, who destroyed deer, robbed fish-ponds, ruined timber, &c. See *BLACK-ART*.

BLACKSTONE (Sir William), an eminent English lawyer, was born at London in July 1723. His father, Mr Charles Blackstone, a silk-man, citizen, and bowyer of London, died some months before the birth of our author, who was the youngest of four children; and their mother died before he was 12 years old. Even from his birth, the care both of his education and fortune was kindly undertaken by his maternal uncle Mr Thomas Bigg, an eminent surgeon in London, and afterwards, on the death of his elder brothers, owner of the Chilton estate, which is still enjoyed by that family. In 1730 being about seven years old, he was put to school at the Charter-house; and in 1735 was, by the nomination of Sir Robert Walpole, on the recommendation of Charles Wither of Hall in Hampshire, Esq; his cousin by the mother's side, admitted upon the foundation there. In this excellent seminary he applied himself to every branch of youthful education, with the same assiduity which accompanied his studies through life. His talents and industry rendered him the favourite of his masters, who encouraged and assisted him with the utmost attention: so that at the age of 15 he was at the head of the school, and although so young, was thought well qualified to be removed to the university. He was accordingly entered a commoner at Pembroke college in Oxford, on the 30th of November 1738, and was the next day matriculated. At this time he was elected to one of the Charter-house exhibitions by the governors of that foundation, to commence from the Michaelmas preceding; but was permitted to continue a scholar there till after the 12th of December, being the anniversary commemoration of the founder, to give him an opportunity of speaking the customary oration which he had prepared, and which did him much credit. About this time also he obtained Mr Benson's gold prize-medal of Milton, for verses on that poet. In the February following, the society of Pembroke college unanimously elected him to one of Lady Holford's exhibitions for Charter-house scholars in that house. Here he prosecuted his studies with unremitting ardour; and although the classics, and particularly

Blackness
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Blackstone.

Blackstone. cularly the Greek and Roman poets, were his favourites, they did not entirely engross his attention: logic, mathematics, and the other sciences, were not neglected. At the early age of 20, he compiled a treatise entitled *Elements of Architecture*, intended for his own use only, and not for publication; but esteemed by those judges who have perused it, in no respect unworthy his maturer judgment and more exercised pen.

Having determined on his future plan of life, and made choice of the law for his profession, he was entered in the Middle Temple on the 20th of November 1741. He now found it necessary to quit the more amusing pursuits of his youth, for the severer studies to which he had dedicated himself; and betook himself seriously to reading law. He expressed his disagreeable sensations on this occasion in a copy of verses, since published by Dodsley in vol. 4th of his miscellanies, intitled *The Lawyer's Farewell to his Muse*: in which the struggle of his mind is expressed so strongly, so naturally, with such elegance of sense and language, and harmony of versification, as must convince every reader that his passion for the muses was too deeply rooted to be laid aside without much reluctance; and that, if he had pursued that flowery path, he would perhaps have proved inferior to few of our English poets. Several little fugitive pieces besides this, have at times been communicated by him to his friends; and he left (but not with a view of publication) a small collection of juvenile pieces, both originals and translations, inscribed with this line from Horace,

Nec luisse pudet, sed non incidere ludum.

Some notes on Shakespeare, which just before his death he communicated to Mr Steevens, and which were inserted by him in his last edition of that author, show how well he understood the meaning, as well as the beauties, of that his favourite among the English poets.

In November 1743, he was elected into the society of All-Souls college; and in the November following, he spoke the anniversary speech in commemoration of archbishop Chicheley the founder, and the other benefactors to that house of learning, and was admitted actual fellow. From this period he divided his time between the university and the Temple, where he took chambers in order to attend the courts: in the former he pursued his academical studies, and on the 12th of June 1745 commenced bachelor of civil law; in the latter he applied himself closely to his profession, both in the hall and in his private studies, and on the 28th of November 1746 was called to the bar. Though he was little known or distinguished in Westminster hall, he was actively employed, during his occasional residence at the university, in attending to its interests, and mingling with and improving its interior concerns. In May 1749, as a small reward for his services, and to give him further opportunities of advancing the interests of the college, Mr Blackstone was appointed steward of their manors. And in the same year, on the resignation of his uncle Seymour Richmond, Esq; he was elected recorder of the borough of Wallingford in Berkshire, and received the king's approbation on the 30th of May. The 26th of April 1750, he commenced doctor of civil law, and thereby became a member of the

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convocation, which enabled him to extend his views beyond the narrow circle of his own society, to the general benefit of the university at large. In the summer 1753, he took the resolution of wholly retiring to his fellowship and an academical life, still continuing the practice of his profession as a provincial counsel.

His Lectures on the Laws of England appears to have been an early and favourite idea; for in the Michaelmas term, immediately after he quitted Westminster-hall, he entered on the province of reading them at Oxford; and we are told by the author of his life, that even at their commencement, such were the expectations formed from the acknowledged abilities of the lecturer, they were attended by a very crowded class of young men of the first families, characters, and hopes; but it was not till the year 1758, that the lectures in the form they now bear were read at the university. Mr Viner having by his will left not only the copyright of his abridgment, but other property to a considerable amount, to the university of Oxford, to found a professorship, fellowships, and scholarships of common law, he was on the 20th of October 1758 unanimously elected Vinerian professor; and on the 25th of the same month read his first introductory lecture, which he published at the request of the vice-chancellor and heads of houses, and afterwards prefixed to the first volume of his Commentaries. His lectures now had gained such universal applause, that he was requested by a noble personage who superintended the education of our present sovereign then prince of Wales, to read them to his Royal Highness; but as he was at that time engaged to a numerous class of pupils in the university, he thought he could not, consistently with that engagement, comply with this request, and therefore declined it. But he transmitted copies of many of them for the perusal of his royal highness; who, far from being offended at an excuse grounded on so honourable a motive, was pleased to order a handsome gratuity to be presented to him. It is doubtful whether the Commentaries were originally intended for the press; but many imperfect and incorrect copies having got abroad, and a pirated edition of them being either published, or preparing for publication in Ireland, the learned lecturer thought proper to print a correct edition himself; and in November 1765 published the first volume under the title of *Commentaries on the Laws of England*; and in the course of the four succeeding years, the remaining parts of this admirable work. It ought to be remarked, that before this period the reputation his lectures deservedly acquired him had induced him to resume his practice in Westminster-hall; and in a course somewhat inverted from the general progress of his profession, he who had quitted the bar for an academic life, was sent back from the college to the bar, with a considerable increase of business. He was likewise elected into parliament, first for Hindon, and afterwards for Westbury in Wilts; but in neither of these departments did he equal the expectations his writings had raised. The part he took in the Middlesex election drew upon him the attack of some persons of ability in the senate, and likewise a severe animadversion of one of the keenest polemical writers * in the paper war of that day. This circumstance probably strengthened the aversion he professed to parliamentary attendance; "where, (he said) amidst the rage of contending parties,

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* Junius.

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ties, a man of moderation must expect to meet with no quarter from any side:" and when, on the resignation of Mr Dunning in 1770, he was offered the place of solicitor-general, he refused that office; but shortly afterwards, on the promotion of Sir Joseph Yates to a seat in the court of common-pleas, accepted a seat on the bench, and by the death of Sir Joseph succeeded him there also. As a judge, he was not inactive; but, when not occupied in the duties of his station, was generally engaged in some scheme of public utility. The act for detached houses for hard labour for convicts, as a substitute for transportation, owed its origin in a great measure to him.

It ought not to be omitted, that the last augmentation of the judges salaries, calculated to make up the deficiencies occasioned by the heavy taxes they are subject to, and thereby render them more independent, was obtained in a great measure by his industry and attention. This respectable and valuable man died on the 14th of February 1780, in the 50th year of his age.

BLACKWALL (Anthony, A. M.), a learned author, after completing his academical education at Emanuel college, Cambridge, was appointed head master of the free school at Derby, and lecturer of All-hallows there, where he first distinguished himself in the literary world by an edition of Theognis, printed at London in 1706, and was afterwards head master of the free school at Market-Bosworth in Leicestershire. The Grammar whereby he initiated the youth under his care into Latin, was of his own composing, and so happily fitted for the purpose, that he was prevailed on to make it public, though his modesty would not permit him to fix his name to it, because he would not be thought to prescribe to other instructors of youth. It is intitled, "A New Latin Grammar; being a short, clear, and easy Introduction of young Scholars to the Knowledge of the Latin Tongue; containing an exact Account of the two first Parts of Grammar." In his "Introduction to the Classics," first published in 1718, 12mo, he displayed the beauties of those admirable writers of antiquity, to the understanding and imitation even of common capacities; and that in so concise and clear a manner, as seemed peculiar to himself. But his greatest and most celebrated work was, "The Sacred Classics defended and illustrated; or, An Essay humbly offered towards preserving the Purity, Propriety, and True Eloquence of the Writers of the New Testament," in 2 vols. Mr Blackwall had the felicity to bring up many excellent scholars in his seminaries at Derby and Bosworth; among others, the celebrated Richard Dawes, author of the *Miscellanea Critica*. A gentleman who had been his scholar, being patron of the church of Clapham in Surrey, presented him to that living as a mark of his gratitude and esteem. This happening late in life, and Blackwall having occasion to wait upon the bishop of the diocese, he was somewhat pertly questioned by a young chaplain as to the extent of his learning. "Boy (replied the indignant veteran), I have forgot more than ever you knew!" He died at Market-Bosworth, April 8. 1730.

BLACKWELL (Thomas), an eminent Scottish writer, was son of a minister at Aberdeen, and born there 1701. He had his grammatical learning at a school in Aberdeen, studied Greek and philosophy in the Marischal college there, and took the degree of

M. A. in 1718. Being greatly distinguished by uncommon parts, and an early proficiency in letters, he was, Dec. 1723, made Greek professor in the college where he had been educated; and continued to teach that language with applause even to his death. In 1737, was published at London, but without his name, "An Enquiry into the life and writings of Homer," 8vo; a second edition of which appeared in 1736; and not long after, "Proofs of the Enquiry into Homer's life and writings," which was a translation of the Greek, Latin, Spanish, Italian, and French notes, subjoined to the original work. In 1748, he published "Letters concerning Mythology," 8vo; without his name also. The same year, he was made principal of the Marischal college in Aberdeen, and is the only layman who hath been appointed principal of that college, since the patronage came to the Crown, by the forfeiture of the Marischal family, in 1716; all the other principals having been ministers of the church of Scotland. March 1752, he took the degree of doctor of laws: and the year following came out the first volume of his *Memoirs of the Court of Augustus*, 4to. The second volume appeared in 1755; and the third, which was posthumous, and left incomplete by the author, was fitted for the press by John Mills, Esq; and published in 1764. At the same time was published a third edition of the two former volumes: Which is a proof of the good reception the work met with from the public; though it must be acknowledged that the parade with which it is written, and the peculiarity of its language, exposed it to some severity of censure.

Soon after he became principal of his college, he married a merchant's daughter of Aberdeen, by whom he had no children. Several years before his death, his health began to decline: his disorder was of the consumptive kind, and thought to be forwarded by an excess of abstemiousness which he imposed upon himself. His disease increasing, he was advised to travel, and accordingly set out in Feb. 1757; however, he was not able to go farther than Edinburgh, in which city he died the 8th of March following, in his 56th year. He was a very ingenious and very learned man: he had an equable flow of temper, and a truly philosophic spirit, both which he seems to have preserved to the last; for on the day of his death he wrote to several of his friends.

BLACKWELL (Alexander), son of a dealer in knit-hose at Aberdeen, where he received a liberal education, studied physic under Boerhaave at Leyden, took the degree of M. D. and acquired a proficiency in the modern languages. On his return home, happening to stay some time at the Hague, he contracted an intimacy with a Swedish nobleman. Marrying a gentleman's daughter in the neighbourhood of Aberdeen, he proposed practising his profession in that part of the kingdom; but in two years finding his expectations disappointed, he came to London, where he met with still less encouragement as a physician, and commenced corrector of the press for Mr Wilkins a printer. After some years spent in this employment; he set up as a printer himself; and carried on several large works till 1734, when he became bankrupt. In what manner he subsisted from this event till the above-mentioned application we do not learn, unless it was by the ingenuity of his wife, who published "A curious

Herbal

Bladder. Herbal containing 500 Cuts of the most useful Plants which are now used in the Practice of Physic, engraved on folio Copperplates, after Drawings taken from the Life, by Elizabeth Blackwell. To which is added a short Description of the Plants, and their common Uses in Physic, 1739," 2 vols folio. In or about the year 1740 he went to Sweden, and renewing his intimacy with the nobleman he knew at the Hague, again assumed the medical profession, and was very well received in that capacity; till turning projector, he laid a scheme before his Swedish majesty for draining the fens and marshes, which was well received, and many thousands employed in prosecuting it under the Doctor's direction, from which he had some small allowance from the king. This scheme succeeded so well, he turned his thoughts to others of greater importance, which in the end proved fatal to him. He was suspected of being concerned in a plot with Count Tessin, and was tortured; which not producing a confession, he was beheaded August 9th 1748; and soon after this event appeared "A genuine Copy of a Letter from a merchant in Stockholm, to his correspondent in London; containing an Impartial Account of Doctor Alexander Blackwell, his Plot, Trial, Character, and Behaviour, both under Examination and at the Place of Execution; together with a Copy of a Paper delivered to a Friend upon the Scaffold." He possessed a good natural genius, but was somewhat flighty and a little conceited. His conversation, however, was facetious and agreeable; and he might be considered on the whole as a well-bred accomplished gentleman.

BLADDER, in anatomy, a thin expanded membranous body, found in several parts of an animal, serving as a receptacle of some juice, or of some liquid excrement; from whence it takes various denominations, as *urine-bladder*, *gall-bladder*, &c.

BLADDER, by way of eminence, is a large vessel which serves as a receptacle of the urine of animals, after its secretion from the blood in the kidneys. This is sometimes also called, by way of distinction, the *urinary bladder*, *vesica urinaria*. The bladder is situated in the pelvis of the abdomen; in men immediately on the rectum; in women on the vagina uteri. See **ANATOMY**.

Though the urinary bladder be naturally single, yet there have been instances of nature's varying from herself in this particular. The bladder of the famous Casaubon, upon dissecting his body after his death, was found to be double; and in the Philosophical Transactions, we have an account of a triple bladder found in the body of a gentleman who had long been ill and no one could guess the cause.

The urinary bladders of brutes are differently contrived from the human bladder, and from each other according to the structure, œconomy, and manners of living of each creature. See *Comparative ANATOMY*.

Bladders, when below a certain magnitude, are more usually denominated by the diminutive vesicles, *vesiculae*. Of these we meet with many sorts both in the animal and vegetable world; some natural, as in the lungs, especially of frogs, and, as some also imagine, in the muscles; others morbid or preternatural, as the *hydatidis*, and those observable in the itch. Naturalists have also discovered bladders in the thorax and abdo-

men of birds, as well as others in the belly of fishes, called *air-bladders*, and *swims*.

Vegetable bladders are found every where in the structure of the bark, the fruit, pith, and *parenchyma* or pulp; besides those morbid ones raised on the surface of leaves by the puncture of insects.

BLADDER-Nut. See **STAPHYLÆA**.

BLADDER-Senna. See **COLUTEA**.

BLADE, in commerce, a thin slender piece of metal either forged by the hammer or run and cast in moulds to be afterwards sharpened to a point, edge, or the like.

Sword-blades are made by the armourers, knife-blades by the cutlers, &c. The English and Damascus blades are most esteemed among the French, those of Vienne in Dauphiny have the preference. The conditions of a good blade of a small sword are, that it be light and tough, apter to bend than break. When it will stand in the bend, it is called a *poor man's blade*.

BLADEN, (Martin), a translator and dramatic author, was formerly an officer in the army, bearing the commission of a lieutenant-colonel in queen Anne's reign, under the great duke of Marlborough, to whom he dedicated a translation of Cæsar's Commentaries, which he had completed, and which is to this day a book held in good estimation. In 1714, he was made one of the Lords Commissioners of Trade and Plantations; and in 1717 was appointed envoy extraordinary to the court of Spain, in the room of — Brett, Esq; but declined it, choosing rather to keep the post he already had, which was worth L. 1000 *per annum*, and which he never parted with till his death, which was in May 1746. He was also many years member of parliament for the town of Portsmouth. He wrote two dramatic pieces; both of which (for the one is only a masque introduced in the third act of the other) were printed in the year 1705, without the author's consent. Their names are, 1. Orpheus and Euridice, a Masque. 2. Solon, a Tragic Comedy.

BLADUM, in middle-age writers, is taken for all sort of standing corn in the blade and ear. The word is also written *blatum*, *blava*, and *blavium*.

In our old charters, the word *bladum* included the whole product of the ground, fruit, corn, flax, grass, &c. and whatever was opposed to living creatures. It was sometimes also applied to all sorts of grain or corn threshed on the floor. But the word was more peculiarly appropriated to bread-corn, or wheat, called in French *blé*. Thus the knights Templars are said to have granted to Sir Wido de Meriton's wife *duas summas bladi*.

BLAEU (William), a famous printer of Amsterdam, a disciple and friend of Tycho Brahe's: his Atlas, his Treatise of the Globes, Astronomical Institutions, &c. and his fine impressions, have secured his memory. He died in 1638.

BLAFART, in commerce, a small coin, current at Cologne, worth something more than a farthing of our money.

BLAGRAVE (John), the second son of John Blagrave, of Bulmarsh-court near Sunning in Berkshire, descended of an ancient family in that country. From a grammar-school at Reading he was sent to St John's college in Oxford, where he applied himself chiefly to the study of mathematics, and without taking any

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degree, afterwards retired to his patrimonial seat of Southcole-lodge near Reading, where he spent the remainder of his life. In this mansion he died in the year 1611; and was buried in the church of St Lawrence, where a sumptuous monument was erected to his memory. Having never married, he bequeathed to all the posterity of his three brothers, the sum of 50 l. each payable at the age of 26; and he calculated his donation so well, that near fourscore of his nephews and their descendants have reaped the benefit of it. He also settled certain lands at Swallowfield in the same county, as a provision for the poor for ever. Among other charities, he left ten pounds to be annually disposed of in the following manner: On good-Friday, the church-wardens of each of the three parishes of Reading send to the town-hall *one virtuous maid, who has lived five years with her master*: there, in the presence of the magistrates, these three virtuous maids throw dice for the ten pounds. The two losers are returned with a fresh one the year following, and again the third year, till each has had three chances. He is said to have been not more remarkable for his mathematical knowledge than for his candour and generosity to his acquaintance. His works are, 1. *A mathematical jewel*. Lond. 1585, fol. 2. *Of the making and use of the familiar staff*. Lond. 1590, 4to. 3. *Astrolabium uranicum generale*, Lond. 1596, 4to. 4. *The art of dialing*. Lond. 1609, 4to.

BLAIN, among farriers, a distemper incident to beasts, being a certain bladder growing on the root of the tongue, against the wind-pipe, which swells to such a pitch as to stop the breath. It comes by great chaffing and heating of the stomach, and is perceived by the beast's gaping and holding out his tongue, and foaming at the mouth. To cure it, cast the beast, take forth his tongue, and then, slitting the bladder, wash it gently with vinegar and a little salt.

BLAIR (John), a Scottish author, was contemporary with, and the companion, some say the chaplain, of Sir William Wallace. He attended that great hero in almost all his exploits; and, after his death, which left so great a stain on the character of Edward I. of England, he wrote his memoirs in Latin. The injury of time has destroyed this work, which might have thrown the greatest light on the history of a very busy and remarkable period. An inaccurate fragment of it only has descended to us, from which little can be learned, and which was published, with a commentary, by Sir Robert Sibbald.

BLAIR (James), an eminent divine, was born and bred in Scotland, where he had at length a benefice in the episcopal church; but meeting with some discouragements, he came to England, in the latter end of the reign of king Charles II. and was sent by Dr Compton as a missionary to Virginia, and was afterwards, by the same bishop, made commissary for that colony, the highest office in the church there. He distinguished himself by his exemplary conduct and unwearied labours in the work of the ministry; and finding that the want of proper seminaries for the advancement of religion and learning was a great damp upon all attempts for the propagation of the gospel, he formed a design of erecting and endowing a college at Williamsburgh, in Virginia, for professors and students in academical learning. He therefore not only

set on foot a voluntary subscription; but, in 1693, came to England to solicit the affair at court: when queen Mary was so well pleased with the noble design, that she espoused it with particular zeal; and king William readily concurring with her majesty, a patent was passed for erecting and endowing a college by the name of the *William and Mary college*, of which Mr Blair was appointed president, and enjoyed that office near 50 years. He was also rector of Williamsburgh, and president of the council in that colony. He wrote, *Our Saviour's divine Sermon on the Mount explained in several sermons*, 4 vols, octavo; and died in 1743.

BLAIR (John), an eminent chronologist, was educated at Edinburgh; and coming to London was for some time usher of a school in Hedge-Lane. In 1754, he obliged the world with that valuable publication, "The Chronology and History of the World, from the Creation to the year of Christ 1753. Illustrated in LVI. Tables; of which four are introductory and contain the centuries prior to the first Olympiad; and each of the remaining LII. contain in one expanded View 50 Years, or half a Century." This volume, which is dedicated to lord chancellor Hardwicke, was published by subscription, on account of the great expence of the plates, for which the author apologized in his preface, where he acknowledged great obligations to the earl of Bath, and announced some chronological dissertations, wherein he proposed to illustrate the disputed points, to explain the prevailing systems of chronology, and to establish the authorities upon which some of the particular æras depend. In January 1755, he was elected a fellow of the Royal Society; and in 1761 of the Society of Antiquaries. In 1756 he published a second edition of his "Chronological Tables." In Sept. 1757, he was appointed chaplain to the Princess Dowager of Wales, and mathematical tutor to the Duke of York; and on Dr Townshend's promotion to the deanery of Norwich, the services of Dr Blair were rewarded, March 10. 1761, with a prebendal stall at Westminster. The vicarage of Hinckley happening to fall vacant six days after, by the death of Dr Morres, Dr Blair was presented to it by the dean and chapter of Westminster; and in August that year he obtained a dispensation to hold with it the rectory of Burton Coggles in Lincolnshire. In September 1763 he attended his royal pupil the duke of York in a tour to the continent; had the satisfaction of visiting Lisbon, Gibraltar, Minorca, most of the principal cities in Italy, and several parts of France, and returned with the duke in August 1764. In 1768 he published an improved edition of his "Chronological Tables," which he dedicated to the Princess of Wales, who had expressed her early approbation of the former edition. To the new edition were annexed, "Fourteen Maps of Ancient and Modern Geography, for illustrating the Tables of Chronology and History. To which is prefixed a Dissertation on the Progress of Geography." In March 1771, he was presented by the dean and chapter of Westminster to the vicarage of St Bride's in the city of London; which made it necessary for him to resign Hinckley, where he had never resided for any length of time. On the death of Mr Sims, in April 1776, he resigned St Bride's, and was presented to the rectory of St John the Evangelist in Westminster; and in June that year obtained a dispensation

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penfation to hold the rectory of St John with that of Horton, near Colebrooke Bucks. His brother captain Blair falling gloriously in the service of his country in the memorable sea-fight of April 12th 1782, the shock accelerated the Doctor's death. He had at the same time the influenza in a severe degree, which put a period to his life, June 24th 1782. His library was sold by auction December 11-13th, 1782; and a course of his "Lectures on the Canons of the Old Testament" hath since been advertised as intended for publication by his widow.

BLAIR of Athol, a castle belonging to the duke of Athol, seated in the county of Athol in Scotland, 28 miles north-west of Perth. W. Long. 3. 30. N. Lat. 56. 46. This castle was besieged by the Highland army in 1746; and bravely defended by Sir Andrew Agnew, who was reduced to eat horse's flesh, until he was relieved by the Hessians under the earl of Crawford.

BLAISE, a military order instituted by the kings of Armenia, in honour of St Blaise, anciently bishop of Sebasta in that country, the patron saint of that nation.

Justinian calls them knights of St Blaise and St Mary, and places them not only in Armenia, but in Palestine. They made a particular vow to defend the religion of the church of Rome, and followed the rule of St Basil. The precise year of the institution of the knights of St Blaise is not known; but they appear to have commenced about the same time with the knights Templars and Hospitallers; to the former of which they bore a near affinity, the regulars being the same in both.

BLAISOS, a province of France, bounded on the north by Beauce, on the east by the Orleanois, on the south by Berry, and on the west by Touraine. Blois is the capital town.

BLAKE (Robert), a famous English admiral, born August 1589 at Bridwater in Somersetshire, where he was educated at the grammar-school. He went from thence to Oxford in 1615, where he was entered at St Alban's Hall. From thence he removed to Wadham college: and on the 10th of February 1617, he took the degree of bachelor of arts. In 1623, he wrote a copy of verses on the death of Mr Camden, and soon after left the university. He was tinctured pretty early with republican principles, and disliking that severity with which Dr Laud, then bishop of Bath and Wells, pressed uniformity in his diocese, he began to fall into the puritanical opinions. His natural bluntness causing his principles to be well known, the puritan party returned him member for Bridgwater in 1640; and he served in the parliament army with great courage during the civil war: but when the King was brought to trial, he highly disapproved the measure as illegal, and was frequently heard to say, *he would as freely venture his life to save the King, as ever he did to serve the parliament*. But this is thought to have been chiefly owing to the humanity of his temper, since after the death of the King he fell in wholly with the republican party, and, next to Cromwell, was the ablest officer the parliament had.

In 1648-9, he was appointed, in conjunction with Colonel Dean and Colonel Popham, to command the fleet; and soon after blocked up Prince Maurice and Prince

Rupert in Kinsale harbour. But these getting out, Blake followed them from port to port: and at last attacked them in that of Malaga, burnt and destroyed their whole fleet, two ships only excepted, the Reformation in which Prince Rupert himself was, and the Swallow commanded by his brother Prince Maurice. In 1652, he was constituted sole admiral; when he defeated the Dutch fleet commanded by Van Trump, Ruyter, and De Wit, in three several engagements, in which the Dutch lost 11 men of war, 30 merchant ships, and, according to their own accounts, had 15,000 men slain. Soon after Blake and his colleagues, with a grand fleet of 100 sail, stood over to the Dutch coast; and forced their fleet to fly for shelter into the Texel, where they were kept for some time by Monk and Dean, while Blake sailed northward. At last, however, Trump got out, and drew together a fleet of 120 men of war; and, on the 3d of June, the generals Dean and Monk came to an engagement with the enemy off the north Foreland with indifferent success: but the next day Blake coming to their assistance with 18 ships, gained a complete victory; so that if the Dutch had not saved themselves on Calais sands, their whole fleet had been sunk or taken.

In April 1653, Cromwell turned out the parliament, and shortly after assumed the supreme power. The states hoped great advantages from this; but were disappointed. Blake said on this occasion to his officers, "It is not for us to mind state affairs, but to keep foreigners from fooling us."—In November 1654, Cromwell sent him with a strong fleet into the Mediterranean, with orders to support the honour of the English flag, and to procure satisfaction for the injuries that might have been done to our merchants. In the beginning of December, Blake came into the road of Cadiz, where he was treated with all imaginable respect: a Dutch admiral would not hoist his flag while he was there; and his name was now grown so formidable, that a French squadron having stopped one of his tenders, which had been separated from Blake in a storm, the admiral, as soon as he knew to whom it belonged, sent for the captain on board, and drank Blake's health before him with great ceremony, under a discharge of five guns, and then dismissed him. The Algerines were so much afraid of him, that, stopping the Sallee rovers, they obliged them to deliver up what English prisoners they had on board, and then sent them freely to Blake, in order to purchase his favour. This, however, did not prevent his coming on the 10th of March before Algiers, and sending an officer on shore to the dey to demand satisfaction for the piracies committed on the English, and the release of all the English captives. The dey, in his answer, alleged, that the ships and captives belonged to private men, and therefore he could not restore them without offending all his subjects, but that he might easily redeem them: and if he thought good, they would conclude a peace with him, and for the future offer no acts of hostility to the English: and having accompanied this answer with a large present of fresh provisions, Blake left Algiers, and sailed on the same errand to Tunis; the dey of which place not only refused to comply with his request, but denied him the liberty of taking in fresh water. "Here (said he), are our castles of Goletto and Porto Ferino; do your worst." Blake, at hearing this, began, as his custom

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Blake.

was when highly provoked, to curl his whiskers; and after a short consultation with his officers, bore into the bay of Porto Ferino with his great ships and their seconds; and coming within musket-shot of the castle and the line, fired on both so warmly, that in two hours time the castle was rendered defenceless, and the guns on the works along the shore were dismounted, though 60 of them played at a time on the English. Blake found nine ships in the road, and ordered every captain to man his long boat with choice men, to enter the harbour and fire the Tuniseens; which they happily effected, with the loss of 25 men killed and 48 wounded, while he and his men covered them from the castle by playing continually on them with their great guns. This daring action spread the terror of his name through Africa and Asia. From Tunis he sailed to Tripoli, caused the English slaves to be set at liberty, and concluded a peace with that government. Thence returning to Tunis, the Tuniseens implored his mercy, and begged him to grant them peace, which he did upon terms highly advantageous to England. He next sailed to Malta, and obliged the knights to restore the effects taken by their privateers from the English; and by these great exploits so raised the glory of the English name, that most of the princes and states in Italy thought fit to pay their compliments to the Protector, by sending solemn embassies to him.

He passed the next winter either in lying before Cadiz, or in cruising up and down the Straits; and was at his old station, at the mouth of that harbour, when he received information that the Spanish Plate fleet had put into the bay of Sancta Cruz, in the island of Teneriffe: upon this he weighed anchor, with 25 men of war, on the 13th of April 1657; and on the 20th rode with his ships off the bay of Sancta Cruz, where he saw 16 Spanish ships lying in the form of a half-moon. Near the mouth of the haven stood a castle furnished with great ordnance; besides which there were seven forts round the bay, with six, four, and three guns on each, joined to each other by a line of communication manned with musketeers. To make all safe, Don Diego Diagues, general of the Spanish fleet, caused all the smaller ships to be moored close along the shore; and the six large galleons stood farther out at anchor, with their broadsides towards the sea. Blake having prepared for the fight, a squadron of ships was drawn out to make the first onset, commanded by Captain Stayner in the Speaker frigate: who no sooner received orders, than he sailed into the bay, and fell upon the Spanish fleet, without the least regard to the forts, which spent their shot prodigally upon them. No sooner were these entered into the bay, but Blake, following after, placed several ships to pour broadsides into the castle and forts; and these played their parts so well, that, after some time, the Spaniards found their forts too hot to be held. In the mean time, Blake struck in with Stayner, and bravely fought the Spanish ships, out of which the enemy were beaten by two o'clock in the afternoon; when Blake, finding it impossible to carry them away, ordered his men to set them on fire; which was done so effectually, that they were all reduced to ashes, except two, which sunk downright, nothing remaining above the water but part of the masts. The English having now obtained a complete victory, were reduced to another difficulty by the wind, which blew so strong

into the bay, that they despaired of getting out. They lay under the fire of the castles and of all the forts, which must in a little time have torn them to pieces. But the wind suddenly shifting, carried them out of the bay; where they left the Spaniards in astonishment at the happy temerity of their audacious victors. This is allowed to have been one of the most remarkable actions that ever happened at sea. "It was so miraculous (says the earl of Clarendon), that all men who knew the place wondered that any sober man, with what courage soever endowed, would ever have undertaken it; and they could hardly persuade themselves to believe what they had done; whilst the Spaniards comforted themselves with the belief, that they were devils and not men who had destroyed them in such a manner." This was the last and greatest action of the gallant Blake. He was consumed with a dropsy and scurvy; and hastened home, that he might yield up his last breath in his native country, which he had so much adorned by his valour. As he came within sight of land, he expired.—Never man, so zealous for a faction, was so much respected and esteemed even by the opposite factions. Disinterested, generous, liberal; ambitious only of true glory, dreadful only to his avowed enemies; he forms one of the most perfect characters of that age, and the least stained with those errors and violences which were then so predominant. The Protector ordered him a pompous funeral at the public charge: but the tears of his countrymen were the most honourable panegyric on his memory. The Lord Clarendon observes, "that he was the first man who brought ships to contemn castles on shore, which had ever been thought very formidable, and were discovered by him to make a noise only, and to fright those who could be rarely hurt by them. He was the first that infused that degree of courage into seamen, by making them see by experience what mighty things they could do if they were resolved; and the first that taught them to fight in fire as well as in water."

BLAMONT, a town of Lorraine in France, seated on a little river called *Vesouze*. E. Long. 6. 51. N. Lat. 48. 35.

BLANC. See BLANK.

BLANC, a town of Berry in France, seated on the river Creuse, by which it is divided into two parts. The land about it is barren, and full of trees, heath, and lakes. E. Long. 1. 13. N. Lat. 46. 38.

Mont-BLANC, a stupendous mountain in Savoy, the highest of the Alps, and encompassed by those wonderful collections of snow and ice called the *Glaciers*. See ALPS.

Of these glaciers there are five, which extend almost to the plain of the vale of Chamouni, and are separated by wild forests, corn-fields, and rich meadows; so that immense tracts of ice are blended with the highest cultivation, and perpetually succeed to each other in the most singular and striking vicissitude. All these several valleys of ice, which lie chiefly in the hollows of the mountains, and are some leagues in length, unite together at the foot of Mont-Blanc; the highest mountain in Europe, and probably of the ancient world.

The summit of this mountain was deemed inaccessible before Dr Paccard, a physician at Chamouni, attempted to reach it in August 1786, and succeeded in the attempt.

Blamont,
Blanc.

Blanc.

attempt. Soon after, the same undertaking was resolved upon and accomplished by M. de Saussure, who has published a narrative of the journey.—He arrived at Chamouni, situated at the foot of the mountain, in the beginning of July 1787; but bad weather prevented him from ascending until the first of August, when he began his expedition, accompanied by a servant and eighteen guides, who carried his philosophical and other apparatus. His son was left at the Priory in Chamouni, and was employed in making meteorological observations, with which those made on the top of the mountain might be compared. Although it is scarcely six miles and three quarters in a straight line from the Priory of Chamouni to the top of Mont-Blanc, it requires nevertheless eighteen hours to gain the summit, owing to the bad roads, the windings, and the great perpendicular height of the mountain. That he might be perfectly at liberty to pass the night on what part of the mountain he pleased, he carried a tent with him; and he and his company slept in it the first night on that eminence which is first met with, and which is on the south of the Priory, and about a mile perpendicularly above the village.

Hitherto the journey was free from danger, or even difficulty; the road being either rocky or covered with grass; but thence upwards it was either wholly covered with snow or consisted of the most slippery ice. But the second day's journey was attended with many difficulties. The ice valley on the side of the hill must be passed, in order to gain the foot of that chain of rocks bordering on the perpetual snows which cover Mont-Blanc. The passage through this valley is extremely dangerous, since it is intersected with numerous wide, deep, and irregular chasms, which can only be crossed by means of bridges naturally formed of snow, and these often very slender, extended as it were over an abyss. One of the guides had almost perished here the evening before, as he with two others went to reconnoitre the road. They had the precaution to tie themselves together with a long rope, and he in the middle had the misfortune to have the snow-bridge, over the wide and deep chasm, break under him, so that he remained suspended between his two comrades. M. de Saussure and his retinue passed very near the opening through which this man had fallen, and shuddered at the danger in which the poor fellow had been involved. The difficulties they had to encounter in this valley, and the winding road they were obliged to take through it, occasioned their being three hours in crossing it, although in a straight line its breadth is not above three quarters of a mile.

After having reached the rocks, they mounted in a serpentine direction to a valley filled with snow, which runs from north to south to the foot of the highest pinnacle. The surface of the snow in this valley has numerous fissures, which penetrate so deep, that their bottom is no where to be seen, although they are of considerable breadth. The sides of these fissures, where the snow is broken perpendicularly, afford an opportunity of observing the successive horizontal layers of snow which are annually formed.

The guides were desirous of passing the night near one of the rocks on the side of this valley; but as the loftiest of them is at least 1400 yards perpendicularly lower than the summit of the mountain, M. de Saussure

was desirous of ascending higher; in consequence of which it would be necessary to encamp on the snow: but he found it difficult to convince his companions of the practicability of the plan. They imagined that during the night an insupportable cold prevailed in those heights which were eternally covered with snow; and they were seriously afraid of perishing. By proper encouragements, however, he induced them to proceed; and at four in the afternoon they arrived at the second of the three plains of snow which they had to pass. Here they encamped at the height of 3100 yards above the Priory of Chamouni, and 4250 yards above the level of the sea, which is about 200 yards higher than the peak of Teneriffe. They did not proceed to the last plain, on account of the day having been far advanced; and they were also apprehensive of exposing themselves to the avalanches which are frequently tumbling from the summit of the mountain. They dug a deep hole in the snow, sufficiently wide to contain the whole company, and covered its top with the tent cloth.

In making this encampment, they began to experience the effects of the rarity of the atmosphere. Robust men, to whom seven or eight hours walking or rather climbing were an absolute nothing, had scarcely raised five or six shovels full of snow, before they were under the necessity of resting and relieving each other almost incessantly. One of them who had gone back a small distance to fill a cask with some water which he had seen in one of the crevices of the snow, found himself so much disordered in his way, that he returned without the water, and passed the night in great pain. M. de Saussure, who is so much accustomed to the air of mountains as to say, "That in general I feel myself better in such air than in that of the plains," was exhausted with the fatigue of making his meteorological observations. The principal inconvenience which the thinness of the air produces, is an excessive thirst. They had no means of procuring water but by melting the snow; and the little stove which they had carried with them, afforded but a feeble supply for twenty men.

This region of the mountain presents to the view nothing but snow of the purest and most dazzling whiteness, forming a very singular contrast with the sky, which appears remarkably black.

"No living creature (says M. de Saussure) is to be seen in these desolate regions, nor is the least trace of vegetation to be discovered. It is the habitation of cold and silence! When I reflected that Dr Paccard, and his guide Jacques Balmat, who first visited these deserts, arrived here at the decline of the day, without shelter, without assistance, and wholly ignorant where or how they were to pass the night, without even the certainty that it was possible for men to exist in the places they had undertaken to visit; and yet that they were able to pursue their journey with unremitted intrepidity, I could not but admire their strength and courage. My guides were so firmly prepossessed with the fear of cold, that they shut up every aperture of the tent with the utmost exactness; so that I suffered very considerably from the heat and the vitiated air, which had become highly noxious from the breaths of so many people in a small room. I was frequently obliged, in the course of the night, to go out of the tent, in order

Blanc.

Blanc.

to relieve my breathing. The moon shone with the brightest splendor, in the midst of a sky as black as ebony. Jupiter, rayed like the sun, arose from behind the mountain in the east. The light of these luminaries was reflected from the white plain or rather basin in which we were situated; and dazzling eclipsed every star except those of the first and second magnitude. At length we composed ourselves to sleep. We were, however, soon awakened by the noise of an immense mass of snow (*avalanche*) which had fallen down from the top of the mountain, and covered part of the slope over which we were to climb the next day."

As they were obliged to melt a great quantity of snow, and prepare many necessaries for their farther progress in their journey, it was late the next morning before they took their departure.

"We began our ascent (continues M. de Saussure) to the third and last plain, and then turned to the left, in our way to the highest rock, which is on the east part of the summit. The ascent is here very steep, being about 39 degrees inclined to the horizon, and bounded on each side by precipices. The surface of the snow was so hard and slippery, that our pioneers were obliged to hew out their footsteps with hatchets. Thus we were two hours in climbing a hill of about 530 yards high. Having arrived at this last rock, we turned to the westward, and climbed the last ascent, whose height is about 300 yards, and its inclination about 28 or 29 degrees. On this peak the atmosphere is so rare, that a man's strength is exhausted with the least fatigue. When we came near the top, I could not walk fifteen or sixteen steps without stopping to take breath; and I frequently perceived myself so faint, that I was under the necessity of sitting down from time to time; and in proportion as I recovered my breath, I felt my strength renewed. All my guides experienced similar sensations, in proportion to their respective constitutions. We arrived at the summit of Mont-Blanc at 11 o'clock in the forenoon.

"I now enjoyed the grand spectacle which was under my eyes. A thin vapour, suspended in the inferior regions of the air, deprived me of the distinct view of the lowest and most remote objects, such as the plains of France and Lombardy; but I did not so much regret this loss, since I saw with remarkable clearness what I principally wished to see, viz. the assemblage of those high ridges, with the true form and situations of which I had long been desirous of becoming thoroughly acquainted. I could scarce believe my eyes. I thought myself in a dream when I saw below my feet so many majestic peaks, especially the Needles, the Midi, Argentiére, and Géant, whose bases had proved so difficult and dangerous of access. I obtained a perfect knowledge of their proportion to, and connection with, each other; of their form and structure; and a single view removed more doubts, and afforded more information, than whole years of study.

"While I was thus employed, my guides pitched my tent and were fixing the apparatus for the experiments I had proposed to make on boiling water; but when I came to dispose my instruments for that purpose, I was obliged, almost at every instant, to desist from my labours, and turn all my thoughts to the means of respiration. When it is considered that the mercury in the barometer was no higher than 16 inches

and a line (17.145 inches English), and that this air had consequently little more than half the density of that on the plains, the breathing must necessarily be increased, in order to cause, in a given time, the passage of a sufficient quantity of air through the lungs. The frequency of respiration increased the circulation of the blood, more especially as the arteries on the surface of the body had not the pressure they were usually accustomed to. We were all in a feverish state, as will be seen in the sequel.

"While I remained perfectly still, I experienced but little uneasiness more than a slight oppression about my heart; but, on the smallest bodily exertion, or when I fixed my attention on any object for some moments together, and particularly when I pressed my chest in the act of stooping, I was obliged to rest and pant for two or three minutes. My guides were in a similar condition. We had no appetite; and our provisions, which were all frozen, were not well calculated to excite it: nor had we any inclination for wine or brandy, which increased our indisposition, most probably by accelerating the circulation of the blood. Nothing but fresh water relieved us; and much time and trouble were necessary to procure this article, as we could have no other than melted snow. I remained on the summit till half past three; and though I did not lose a single moment, I was not able to make all those experiments in four hours and an half which I have frequently done in less than three on the sea-side. However, I made with great exactness those which were most essential.

"We returned much easier than I could have expected; since, in descending, we did not experience any bad effects from the compression of the thorax; our respiration was not impeded, and we were not under the necessity of resting, in order to recover our breath and strength. The road down to the first plain was nevertheless by no means agreeable, on account of the great declivity; and the sun, shining so bright on the tops of the precipices below us, made so dazzling an appearance, that it required a good head to avoid growing giddy from the prospect. We pitched our tent again on the snow, though we were more than 400 yards below our last night's encampment. I was here convinced that it was the rarity of the air, and not the fatigue of the journey, that had incommoded us on the summit of the mountain, otherwise we should not have found ourselves so well, and so able to attack our supper with a good appetite. I could now also make my meteorological observations without any inconvenience. I am persuaded that the indisposition in consequence of the rarity of the atmosphere is different in different people. For my own part, I felt no inconvenience at the height of 4000 yards, or nearly two miles and a quarter; but I began to be much affected when I was higher in the atmosphere.

"The next day we found that the ice valley which we had passed on our first day's journey had undergone a considerable change from the heat of the two preceding days, and that it was much more difficult to pass than it had been in our ascent. We were obliged to go down a declivity of snow of no less than 50 degrees of inclination, in order to avoid a chasm which had happened during our expedition. We at length got down as low as the first eminence on the side, about half

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half after nine, and were perfectly happy to find ourselves on a foundation which we were sure would not give way under our feet.

From the narrative, we learn, that the summit of the mountain is a ridge nearly horizontal, lying east and west: the slope at each extremity is inclined from 28 to 30 degrees, the south side between 15 and 20, and the north about 45 or 50. This ridge is so narrow as scarcely to allow two people to walk abroad, especially at the west end, where it resembles the roof of a house. It is wholly covered with snow; nor is any bare rock to be seen within 150 yards of the top. The surface of the snow is scaly, and in some places covered with an icy crust, under which the snow is dusty, and without consistence. The highest rocks are all granites; those on the east side are mixed with steatites; those on the south and the west contain a large quantity of *Ischoerl*, and a little *lapis corneus*. Some of them, especially those on the east, which are about 150 yards below the summit, seem to have been lately shivered with lightning.

M. de Saussure saw no animals on the mountain except two butterflies, which he supposes must have been driven thither by the wind. Lichens are the only vegetables which are found on the more elevated parts of these mountains: the *silene acaulis*, which grows in great quantities on the lower parts, disappears at the height of about two miles above the level of the sea.

M. de Saussure has given us the height of the barometer on the top of Mont-Blanc. August 3. at noon, 16 inches, 0 lines, and $\frac{1}{4}\frac{4}{8}$ of a line, French measure (i. e. 16.181 English); and Reaumur's thermometer was 2.3 below the freezing point. M. Sennebier, at the same time, observed at Geneva the barometer 27.2 $\frac{1}{8}\frac{8}{8}$ (29.020 inches English); and the thermometer 22.6 above freezing. From these data he makes the height of Mont-Blanc 2218 toises, or 14180 English feet (about 2 $\frac{1}{2}$ miles), according to M. de Luc's rule; and 2272 toises, or 14525 English feet, according to M. Trembley's. To these heights 13 toises, or 83 feet, the height of M. Sennebier's room above the lake of Geneva, must be added, to give the height of the mountain above the level of the lake 14263 feet, according to M. de Luc, and 14608 feet according to M. Trembley. Sir George Shuckburgh made the height of Mont-Blanc, by trigonometrical measurement, 14429 feet above the lake, which is almost the mean between the other two. The result of the observations made at Chamouni, contemporary with those on Mont-Blanc, agrees still nearer with Sir George's measurement. The general mean result makes the summit of Mont-Blanc 2450 toises, 15973 English feet, or three miles nearly, above the level of the sea.

M. de Saussure found by his electrometer, that the electricity of the air on the summit of the mountain was positive. Water boiled at 68.993 degrees of a thermometer, which rises to 80 with the barometer 27 French inches high. The wind was north and extremely piercing on the summit; but, southward of the ridge, the temperature of the air was agreeable. The experiments with lime-water, and with the caustic alkali, show that the air was mixed with atmospheric acid or fixed air. See ATMOSPHERE, n° 12, 13.

BLANC-Manger, Fr. *q. d.* white food, is a preparation of dissolved isinglass, milk, sugar, cinnamon, &c.

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boiled into a thick consistence, and garnished for the table with blanched almonds. It is cooling and strengthening.

BLANCARDS, a name given to certain linen cloth, thus called, because the thread used to weave them has been half blanched or bleached before it was used. They are manufactured in Normandy, particularly in the places which are in the district or under the jurisdiction of Pont-Audemer, Bernay, and Lisieux.

BLANCH-FERME, or *Blank farm*, a white farm, that is, where the rent was to be paid in silver, not in cattle. In ancient times, the crown rents were many times reserved to be paid in *libris albis*, called *blanch firmes*: in which case the buyer was holden *dealbare firmam*, viz. his base money or coin, worse than standard, was melted down in the exchequer, and reduced to the fineness of standard silver; or instead thereof be paid to the king 12 d. in the pound by way of addition.

BLANCH-Holding, in law, a tenure by which the vassal is only bound to pay an elusory yearly duty to his superior merely as an acknowledgment of his right. See LAW, Part III. N° clxv. 3.

BLANCHARD (James), an excellent painter, was born at Paris, and learnt the rudiments of his profession under Nicholas Boller his uncle; but left him at 20 years of age, and travelled into Italy. He staid two years at Rome, and from thence went to Venice, where he was so charmed with the works of Titian, Tintoret, and Paul Veronese, that he resolved to follow their manner; and in this he succeeded so far, that at his return to Paris he soon became generally esteemed for the novelty, beauty, and force of his pencil. He painted two galleries at Paris, one belonging to Perault, the first president, and the other to Bullion, superintendant of the finances; but his capital piece is a picture of the descent of the Holy Ghost in the church of Notre Dame. He was seized, in the flower of his age, with a fever and imposthume in the lungs, of which he died in 1683. Of all the French painters Blanchard was esteemed the best colourist, he having carefully studied this part of painting in the Venetian school.

Carte-BLANCHE. See CARTE.

BLANCHING, the art or manner of making any thing white. See BLEACHING.

BLANCHING of Iron-plates, is performed with aquafortis and tin.

BLANCHING of Woollen Stuffs, is done with soap, or with chalk, or with sulphur or brimstone.

BLANCHING of Silk, is performed with soap and brimstone.

BLANCHING of Wax, is by exposing it to the sun and dew. See WAX.

BLANCHING, in coinage, the operation performed on the planchets, or pieces of silver, to give them the requisite lustre and brightness. They also blanch pieces of plate, when they would have them continue white, or have only some parts of them burnished.—Blanching, as it is now practised, is performed by heating the pieces on a kind of peel with a wood fire, in the manner of a reverberatory; so that the flame passes over the peel. The pieces being sufficiently heated and cooled again, are put successively to boil in two pans, which are of copper: in these they put water, common

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Blanching salt, and tartar of Montpellier. When they have been well drained of this water in a copper sieve, they throw sand and fresh water over them; and when dry, they are well rubbed with towels.

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Blanks.

BLANCHING, among gardeners, an operation whereby certain fallots, roots, &c. are rendered whiter than they would otherwise be.—It is thus: After pruning off the tops and roots of the plants to be blanched, they plant them in trenches about ten inches wide, and as many deep, more or less as is judged necessary; as they grow up, care is taken to cover them with earth, within four or five inches of their tops: this is repeated from time to time, for five or six weeks; in which time they will be fit for use, and of a whitish colour where covered by the earth.

BLANCHING also denotes the operation of covering iron plates with a thin coat or crust of tin. See **LAT-TEN**.

BLANCO, a cape or promontory of Africa, in the Atlantic ocean. W. Long. 18. 30. N. Lat. 20. 0.

BLANCO, a promontory of Peru in South America, in the South Sea. W. Long. 81. 10. N. Lat. 11. 50.

BLANDA (anc. geog.), a Roman city in the territory of Barcino in Hispania Citerior: Now *Blanes*, a sea-port town of Catalonia, situated near the river Tordara. E. Long. 3. 40. N. Lat. 41. 30.

BLANDFORD, a town of Dorsetshire in England. It is pleasantly seated on the river Stour near the Downs, but has been subject to several dreadful fires, particularly in 1731, when almost the whole town was burnt down; but it has since been rebuilt finer than before. It has the title of a marquissate, and lies in W. Long. 2. 15. N. Lat. 50. 50.

BLANDONONA (anc. geog.), a small city of Liguria in Italy: Now *Bron*, or *Broui*. See that article.

BLANES. See **BLANDA**.

BLANK, or **BLANC**, in a general sense, signifies white; and *blancus*, or *blanca*, is more particularly used for a kind of white or silver money, of base alloy, coined by Henry V. in those parts of France then subject to England, valued at 8d. Sterling. They were forbidden by his successor to be current in this realm. In some ancient charters they are called *solida blanci*, *white shillings*.

BLANK also denotes a small copper coin, formerly current in France, at the rate of five deniers Tournois. They had also great blanks, or pieces of three blanks, and others of six, in respect whereof the single sort were called little blanks; but of late they are all become only monies of account.

BLANK, or **BLANK-Ticket**, in lotteries, that to which no prize is allotted. The French have a game, under the denomination *blaque*, answering to our lottery.

BLANK, in coinage, a plate, or piece of gold or silver, cut and shaped for a coin, but not yet stamped.

BLANK-Bar, in law, is used for the same with what we call a *common bar*, and is the name of a *plea in bar*, which in an action of trespass is put in to oblige the plaintiff to assign the certain place where the trespass was committed.

BLANKS, in judicial proceedings, certain void spaces sometimes left by mistake. A blank (if something material be omitted) in a declaration, abates the same: and such a blank is a good cause of demurrer.

BLANK-Verse, in the modern poetry, that composed of a certain number of syllables, without the assistance of rhyme. See **POETRY**, Part iii.

Point-BLANK. See **POINT-Blank**.

BLANKENBERG, a town of Germany, in the circle of Westphalia and duchy of Berg. E. Long. 7. 18. N. Lat. 50. 54.

BLANKENBURG, a town of Germany, in the circle of Lower Saxony, and capital of the county of the same name, subject to the Duke of Brunswic-Wolfenbüttele. The castle or palace is a modern building, and is the residence of the princess dowager. E. Long. 11. 20. N. Lat. 51. 50.

BLANKENHEIM, a small territory of Germany with the title of a county, which is part of that of Eyffel, near the archbishopric of Cologne and duchy of Juliers.

BLANKET, in commerce, a warm woolly sort of stuff, light and loose woven, chiefly used in bedding. The manufacture of blankets is chiefly confined to Witney in Oxfordshire, where it is advanced to that height, that no other place comes near it. Some attribute a great part of the excellency of the Witney blankets to the absterfive nitrous water of the river Windrush, wherewith they are scoured; others rather think they owe it to a peculiar way of loose spinning which the people have thereabouts. Be this as it will, the place has engrossed almost the whole trade of the nation for this commodity; insomuch that the wool fit for it centres here from the furthest parts of the kingdom. Blankets are made of felt-wool, i. e. wool from off sheep-skins, which they divide into several sorts. Of the head wool and bay wool they make blankets of twelve, eleven, and ten quarters broad; of the ordinary and middle sort blankets of eight and seven quarters broad; of the best tail wool blankets of six quarters broad, commonly called *cuts*, serving for seamen's hammocks. See **HYKES**.

Tossing in a BLANKET, a ludicrous kind of punishment, of which we find mention in the ancients under the denomination *sagatio*. Martial describes it graphically enough. *Ibis ad excussio, missus ad astra, sago*. A late writer represents it as one of Otho's imperial delights. But this is turning the tables: that emperor's diversion, as related by Suetonius, was not to be the subject, but the agent, in the affair: it being his practice to stroll out in dark nights, and where he met with a helpless or drunken man to give him the discipline of the blanket.

BLANKOF (John Teunisz), a painter of great abilities, was born at Alkmaar in 1628; and received his earliest instruction from Arent Tierling: but afterwards he was successively the disciple of Peter Scheyenburg and Cæsar Van Everdingen. When he had spent some years with those masters, he went to Rome, where, during his continuance in that city, he was studiously diligent in copying the works of the best masters, and was admitted into the society of Flemish painters called *Bentvogels*, who gave him the name of *Jan Maat* (which in Dutch signifies mate or companion), and by that name he is most generally known. His subjects were landscapes, with views of rivers or sea-shores, havens or ports, which he executed with a light free pencil; and in the representation of storms and calms (as nature was always his model) he described those subjects

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Blanko2

Blanquille jects with great truth, exactness, and neatness of handling. The pictures of this master which are most commended are the Italian sea-ports, with vessels lying before them. He possessed a lively imagination; nor was his hand less expeditious than his thoughts; and the connoisseurs agreed in opinion, that if he had bestowed more labour on his pictures than he usually did, or if he had finished them more highly, he would certainly have destroyed a great deal of their spirit, force, and effect. His most capital performance is a view of the sea-shore, with the waves retiring at ebb tide; which is described by Houbraken as being wonderfully beautiful and natural. He died in 1670.

BLANQUILLE, in commerce, a small silver coin current in the kingdom of Morocco, and all that part of the coast of Barbary; it is worth about three halfpence of our money.

BLARE, in commerce, a small copper coin of Bern, nearly of the same value with the ratz.

BLAREGNIES, a town of the Austrian Netherlands, in the province of Hainault, seated in E. Long. 3. 35. N. Lat. 50. 30. Near this place the English and their allies under the Duke of Marlborough obtained a very bloody victory over the French in 1709. This is most commonly called the *battle of Malplaquet*. See **MALPLAQUET**.

BLASE, bishop of Sebasta in Cappadocia, in the second and third centuries, suffered death under Dioclesian by decapitation, after being whipped and having his flesh torn with iron combs. He is a person of great note among the vulgar, who in their processions relative to the woollen trade, always carry a representation of him as the inventor or patron of the art of wool-combing; though that art must have been known long before his time. It is difficult to say how the invention came to be attributed to him; but it had probably no better origin than the circumstance of his being tortured by instruments used in combing of wool.

BLASIA, **LEATHER-CUP**: A genus of the order of algæ, belonging to the cryptogamia class of plants; and in the natural method ranking under the 57th order, *Algæ*. The male calyx is cylindric, replete with grains; the female calyx is naked; the fruit roundish, immersed in the leaves, and many-seeded.—Of this genus there is but one species known, the pusilla, which grows naturally on the banks of ditches and rivulets, in a gravelly or sandy soil, both in England and Scotland. It grows flat upon the ground in a circle or patch, composed of numerous thin, green, pellucid, leaves, marked with a few whitish veins near the base, divided and subdivided into obtuse segments obscurely crenated on the edges. The margins of the leaves are a little elevated, but the interior parts adhere close to the ground by a fine down which answers the purpose of roots. The seeds are so small as to be almost imperceptible.

BLASPHEMY (*blasphemia*, or *blasphemium*), in middle-age writers, denotes simply the blaming or condemning of a person or thing. The word is Greek, *βλασφημία*, from *βλαπτω*, *ludo*. Among the Greeks to blaspheme was to use words of evil omen, or that portended something ill, which the ancients were careful to avoid, substituting in lieu of them other words of

softer and gentler import, sometimes the very reverse of the proper ones.

BLASPHEMY is more peculiarly restrained to evil or reproachful words spoken of the Deity. Augustine says, *Jam vulgo blasphemia non accipitur nisi mala verba de Deo dicere*.

According to Lindwood, blasphemy is an injury offered to God, by denying that which is due and belonging to him; or attributing to him what is not agreeable to his nature. By the Mosaic law, blasphemy was punished with death; Levit. xxiv. ver. 13—16. As also by the civil law; Novel. 77. In Spain, Naples, France, and Italy, the pains of death are not now inflicted. In the Empire, either amputation or death is made the punishment of this crime.

By the canon law, blasphemy was punished only by a solemn penance; and by custom either by a pecuniary or corporal punishment. By the English laws, blasphemies of God, as denying his being or providence, and all contumelious reproaches of Jesus Christ, &c. are offences by the common law, and punishable by fine, imprisonment, and pillory. And, by the statute law, he that denies one of the persons in the Trinity, or asserts there are more than one God, or denies Christianity to be true, for the first offence is rendered incapable of any office; for the second, adjudged incapable of suing, being executor or guardian, receiving any gift or legacy, and to be imprisoned for three years.

According to the law of Scotland, the punishment of blasphemy is death. The first species thereof consists in railing at or cursing God; and here the single act constitutes the crime. The second consists in denying the existence of the Supreme Being, or any of the persons of the Trinity; and therein obstinately persevering to the last. For reiterated denial does not fully constitute the crime, because the stat. of Char. II. 1661, admits of repentance before conviction, as a complete expiation.

This statute of 1661 is ratified by a statute of king William, whereby the calling in question the existence of God, or of any of the persons of the Trinity, or the authority of Scripture, or the Divine Providence, is made penal: For the first offence, imprisonment till satisfaction given by public repentance in sack-cloth; for the second, a fine of a year's valued rent of the real estate, and twentieth part of the personal estate; and the trial in both these cases is competent to inferior judges. The trial of the third offence is death, to be tried only by the justices.

BLASPHEMY against the Holy Ghost. Divines are not agreed with respect to the nature of the crime thus denominated (Mat. chap. xii. ver. 31.), and the grounds of the extreme guilt ascribed to it. Dr Tillotson maintains, that it consisted in maliciously attributing the miraculous operations which Christ performed by the power of the Holy Ghost to the devil. Dr Whitby refers it to the dispensation of the Holy Ghost, which commenced after our Lord's resurrection and ascension; and those were guilty of the crime who persisted in their unbelief and blasphemed the Holy Ghost, representing him as an evil spirit. The crime was unpardonable, because it implied a wilful opposition to the last and most powerful evidence which God would vouchsafe to mankind, and precluded the possibility of a recovery to faith and repentance.

Blast
||
Blatta.

BLAST, *flatus*, in the military art, a sudden compression of the air, caused by the discharge of the bullet out of a great gun. The blast sometimes throws down part of the embrasures of the wall.

BLAST is also applied in a more general sense to any forcible stream of wind or air, excited by the mouth, bellows, or the air.

BLAST is also used in agriculture and gardening, for what is otherwise called a *blight*.

Blasts or blights are by some supposed owing to cold; by others to the want of a due supply of sap; by others to ascending fumes of the earth; by others to sharp winds and frosts, immediately succeeding rains. That species called *uredines* or *fire-blasts*, is supposed by Mr Hales owing to the solar rays reflected from or condensed in the clouds, or even collected by the dense steams in hop-gardens and other places. The effect of them is to wither, shrivel, scorch, turn black, and as it were burn up the leaves, blossoms, and fruits of trees, shrubs, herbs, grass, corn, even for whole tracts of ground.

Physicians also speak of a kind of blasts affecting human bodies, and causing erysipelas, palsies, &c.

BLASTS, among miners. See **DAMPS**.

BLASTED, something struck with a blast. Among the Romans, places blasted with lightning were to be consecrated to Jupiter, under the name of *bidentalia* and *putealia*. It was also a ceremonial of religion to burn blasted bodies in the fire.

BLASTING, among miners, a term for the tearing up rocks, which they find in their way, by gunpowder. The method of doing which is this: they make a long hole like the hollow of a large gun-barrel in the rock they would split; this they fill with gunpowder; then they firmly stop up the mouth of the hole with clay, except a touch-hole, at which they leave a match to fire it. A small quantity of powder does great things this way.

BLATOBULGIUM (anc. geog.), Antonine; a place of the Brigantines in Britain, having a camp of exploratores or scouts near Solway Frith and promontory; now called *Bulnesh*, (Camden).

BLATTA, or **COCKROACH**, a genus of insects belonging to the order of hemiptera, or such as have four femicrustaceous incumbent wings. The head of the blatta is inflected towards the breast; the antennæ, or feelers, are hard like bristles; the elytra and wings are plain, and resemble parchment; the breast is smooth, roundish, and is terminated by an edge or margin; the feet are fitted for running; and there are two small horns above the tail. This insect resembles the beetle; and there are 10 species, *viz.* 1. The *gigantea* is of a livid colour, and has square brownish marks on the breast. It is found in Asia and America, and is about the size of a hen's egg. 2. The *alba* is red, and the margin of the breast is white. It is found in Egypt. 3. The *surinamensis* is livid, and the breast edged with white. It is a native of Surinam. 4. The *americana* is of an iron colour, and the hind part of the breast is white. The wings and elytra are longer than its body. It is found in America and the south of France. 5. The *pivea* is white, with yellow feelers. It is a native of America. 6. The *africana* is ash-coloured, and has some hairs on its breast. It is found in Africa. 7. The *orientalis* is of a dusky ash-colour, has short elytra,

with an oblong furrow in them. This species is frequent in America. They get into chests, &c. and do much hurt to cloaths; they infest peoples beds in the night, bite like bugs, and leave a very unfavoury smell behind them. They avoid the light, and seldom appear but in the night-time. The female resembles a kind of caterpillar, as it has no wings; she lays an egg of about one half the bulk of her belly. They eat bread, raw or dressed meat, linen, books, silk-worms and their bags, &c. Sir Hans Sloane says, that the Indians mix their ashes with sugar, and apply them to ulcers in order to promote the suppuration. 8. The *germanica* is livid and yellowish, with two black parallel lines on the breast. It is found in Denmark. 9. The *laponica* is yellow, and the elytra are spotted with black. It is found in Lapland; and feeds upon cheese, fishes, &c. 10. The *oblongata* is of an oblong figure; the colour is livid and shining; and it has two black spots on the breast. The feelers are red and clavated; and the feet are very hairy. It is a native of America.

BLATTARIÆ, (from *Blatta*, a moth or little worm), the title of Scopoli's 12th natural class, in his *Flora Carniolica*. It is taken from the *Blattaria*, which was Tournefort's generic name for the verbascom of Linnæus. See **VERBASCUM**.

BLAUBEUREN, a town of Germany in the circle of Suabia, and duchy of Wirtemberg. E. Long. 9. 57. N. Lat. 48. 22.

BLAVET, a sea-port town of Brittany in France, situated at the mouth of a river of the same name. It is one of the stations of the royal navy of France, and is sometimes called *Port Lewis*. W. Long. 3. 5. N. Lat. 47. 40.

BLAVIA, or **BLAVIUM** (anc. geog.), a town of Aquitain, on the north bank of the Garonne, below its confluence with the Dordone: Now *Blaye*; which see.

BLAYE, an ancient and strong town of France, in Guienne. It is situated on the river Garonne, has a harbour much frequented by foreigners, and the ships which sail to Bourdeaux are obliged to leave their guns here. The river is 3800 yards broad at Blaye; for which reason a battery was built upon an island in 1689, to command the vessels that sail up. The city is built on a rock, and has a citadel with four bastions, which is called the *Upper Town*. The lower town is separated from the upper by a small river; and in the lower town the merchants reside with their magazines. The neighbourhood produces a great deal of corn, which they send abroad when the exportation of it is allowed. W. Long. 1. 23. N. Lat. 45. 6.

BLAZE, a white spot in a horse's face.

BLAZONING, or **BLAZONRY**, in heraldry, the decyphering the arms of noble families. The word originally signified the blowing or winding of a horn; and was introduced into heraldry as a term denoting the description of things borne in arms, with their proper significations and intendments, from an ancient custom the heralds, who were judges, had of winding an horn at jousts and tournaments, when they explained, and recorded the achievements of knights. See **HERALDRY**.

BLEA, in the anatomy of plants, the inner rind or dry bark. See **PLANTS**.

BLEACHING, the art of whitening linen cloth, thread,

Blattariæ
||
Bleaching.

Bleaching. thread, &c. which is conducted in the following manner by the bleachers of this country.

After the cloth has been sorted into parcels of an equal fineness as near as can be judged, they are latched, linked, and then steeped. Steeping is the first operation which the cloth undergoes, and is performed in this manner. The linens are folded up, each piece distinct, and laid in a large wooden vessel; into which is thrown, blood-warm, a sufficient quantity of water, or equal parts of water and lye, which has been used to white cloth only, or water with rye-meal or bran mixed with it, till the whole is thoroughly wet, and the liquor rises over all. Then a cover of wood is laid over the cloth, and that cover is secured with a post betwixt the boards and the joisting, to prevent the cloth from rising during the fermentation which ensues. About six hours after the cloth has been steeped in warm water, and about twelve in cold, bubbles of air arise, a pellicle is formed on the surface of the liquor, and the cloth swells when it is not pressed down. This intestine motion continues from 36 to 48 hours, according to the warmth of the weather; about which time the pellicle or scum begins to fall to the bottom. Before this precipitation happens, the cloth must be taken out; and the proper time for taking it out is when no more air-bubbles arise. This is allowed to be the justest guide by the most experienced bleachers.

The cloth is then taken out, well rinsed, disposed regularly by the selvage, and washed in the put-mill to carry off the loose-dust. After this it is spread on the field to dry: When thoroughly dried, it is ready for bucking; which is the second operation.

Bucking, or the application of salts, is performed in this manner. The first, or mother lye, is made in a copper, which we shall suppose, for example, when full, holds 170 Scots gallons of water. The copper is filled three-fourths full of water, which is brought to boil: just when it begins, the following proportion of ashes is put into it, viz. 30 lb. of blue, and as much white pearl-ashes; 200 lb. of Marcott ashes (or, if they have not these, about 300 lb. of Cashub); 300 lb. of Muscovy, or blanch ashes; the three last ought to be well pounded. This liquor is allowed to boil for a quarter of an hour, stirring the ashes from the bottom very often; after which the fire is taken away. The liquor must stand till it has settled, which takes at least six hours, and then it is fit for use.

Out of their first, or mother-lye, the second, or that used in bucking, is made in this manner. Into another copper, holding, for example, 40 Scots gallons, are put 38 gallons of water, 2 lb. soft soap, and 2 gallons of mother-lye; or, for cheapness, in place of the soap, when they have lye which has been used to white linen, called *white linen lye*, they take 14 gallons of it, leaving out an equal quantity of water. This is called *bucking-lye*.

After the linens are taken up from the field dry, they are set in the *vat* or *cave*, as their large vessel is called, in rows, endwise, that they may be equally wet by the lye; which, made blood-warm, is now thrown on them, and the cloth is afterwards squeezed down by a man with wooden shoes. Each row undergoes the same operation, until the vessel is full, or all the cloth in it. At first the lye is put on milk-warm, and, after standing a little time on the cloth, it is again let off by a cock

Bleaching. into the bucking-copper, heated to a greater degree, and then put on the cloth again. This course is repeated for six or seven hours, and the degree of heat gradually increased, till it is, at the last turn or two, thrown on boiling hot. The cloth remains after this for three or four hours in the lye; after which the lye is let off, thrown away, or used in the first buckings, and the cloth goes on to another operation.

It is then carried out, generally early in the morning, spread on the grass, pinned, corded down, exposed to the sun and air, and watered for the first six hours, so often, that it never is allowed to dry. Afterwards it is allowed to lie till dry spots appear before it is watered. After seven at night it gets no more water, unless it be a very drying night. Next day, in the morning and forenoon, it is watered twice or thrice if the day be very dry; but if the weather be not drying, it gets no water: After which it is taken up dry if the green be clean; if not, it is rinsed, mill-washed, and laid out to dry again, to become fit for bucking.

This alternate course of bucking and watering is performed for the most part from ten to sixteen times, or more, before the linen is fit for souring; gradually increasing the strength of the lye from the first to the middle bucking, and from that gradually decreasing it till the souring begins. The lyes in the middle buckings are generally about a third stronger than the first and last.

Souring, or the application of acids to cloth, is the fourth operation. It is difficult to say when this operation should commence, and depends mostly on the skill and experience of the bleacher. When the cloth has an equal colour, and is mostly freed from the sprat, or outer bark of the lint, it is then thought fit for souring; which is performed in the following manner. Into a large vat or vessel is poured such a quantity of buttermilk, or sour milk, as will sufficiently wet the first row of cloth; which is tied up in loose folds, and pressed down by two or three men bare footed. If the milk is thick, about an eighth of water is added to it; if thin, no water. Sours made with bran, or rye-meal and water, are often used instead of milk, and used milk-warm. Over the first row of cloth a quantity of milk and water is thrown, to be imbibed by the second; and so it is continued till the linen to be soured is sufficiently wet, and the liquor rises over the whole. The cloth is then kept down by covers filled with holes, and secured with a post fixed to the joist, that it may not rise. Some hours after the cloth has been in the sour, air-bubbles arise, a white scum is found on the surface, and an intestine motion goes on in the liquor. In warm weather it appears sooner, is stronger, and ends sooner, than in cold weather. Just before this fermentation, which lasts five or six days, is finished, at which time the scum falls down, the cloth should be taken out, rinsed, mill-washed, and delivered to the women to be washed with soap and water.

Washing with soap and water is the fifth operation; and is performed thus. Two women are placed opposite at each tub, which is made of very thick staves, so that the edges, which slope inwards, are about four inches in thickness. A small vessel full of warm water is placed in each tub. The cloth is folded so that the selvage may be first rubbed with soap and warm water lengthwise, till it is sufficiently impregnated with it.

In

Bleaching. In this manner all the parcel is rubbed with soap, and afterwards carried to be bucked.

The lye now used has no soap in it, except what it gets from the cloth; and is equal in strength to the strongest formerly used, or rather stronger, because the cloth is now put in wet. From the former operation these lyes are gradually made stronger, till the cloth seems of an uniform white, nor any darkness or brown colour appears in its ground. After this the lye is more speedily weakened than it was increased; so that the last which the cloth gets is weaker than any it got before.

But the management of sours is different; for they are used strongest at first, and decreased so in strength, that the last sour, considering the cloth is then always taken up wet, may be reckoned to contain three-fourths of water.

From the bucking it goes to the watering, as formerly, observing only to overlap the selvages, and tie it down with cords, that it may not tear; then it returns to the sour, milling, washing, bucking, and watering again. These operations succeed one another alternately till the cloth is whitened; at which time it is blued, starched, and dried.

This is the method used in the whitening fine cloths. The following is the method used in the whitening of coarse cloths.

Having sorted the cloths according to their quality, they are steeped in the same manner as the fine, rinsed, washed in the mill, and dried before boiling.

In this process boiling supplies the place of bucking, as it takes less time, and consequently is thought cheapest. It is done in the following manner: 200lb. Cashub-ashes, 100lb. white Muscovy, and 30lb. pearl-ashes, boiled in 105 Scots gallons of water for a quarter of an hour, as in the process for the fine cloth, makes the mother or first lye. The cloth-boiler is then to be filled two-thirds full with water and mother-lye, about nine parts of the former to one of the latter; so that the lye used for boiling the coarse cloth is about a third weaker than that used in bucking the fine. Such a quantity of cloth is put into the foregoing quantity of lye, when cold, as can be well covered by it. The lye is brought gradually to the boil, and kept boiling for two hours; the cloth being fixed down all the time, that it does not rise above the liquor. The cloth is then taken out, spread on the field, and watered, as mentioned before in the fine cloth.

As the salts of the lye are not exhausted by this boiling, the same is continued to be used all that day, adding, at each boiling, so much of the mother-lye as will bring it to the same strength as at first. The lye by boiling loses in quantity somewhat betwixt a third and a fourth; and they reckon that in strength it loses about a half, because they find in practice, that adding to it half its former strength in fresh lye, has the same effect on cloth. Therefore some fresh lye, containing a fourth part of the water, and the half of the strength of the first lye, makes the second boiler equal in strength to the first. To the third boiler they add somewhat more than the former proportion, and go on still increasing gradually to the fourth and fifth, which is as much as can be done in a day. The boiler is then cleaned, and next day they begin with fresh lye. These additions of fresh lye ought always to be made by the ma-

ster-bleacher, as it requires judgment to bring succeeding lyes to the same strength as the first.

When the cloth comes to get the second boiling, the lye should be a little stronger, about a thirtieth part, and the deficiencies made up in the same proportion. For six or seven boilings, or fewer, if the cloth be thin, the lye is increased in this way, and then gradually diminished till the cloth is fit for souring. The whitest cloth ought always to be boiled first, that it may not be hurt by what goes before.

In this process, if the cloth cannot be got dry for boiling, business does not stop as in the fine; for after the coarse has dripped on racks made for the purpose, it is boiled, making the lye strong in proportion to the water in the cloth.

The common method of souring coarse linen is, to mix some warm water and bran in the vat, then put a layer of cloth, then more bran, water, and cloth: and so on, till the cave is full. The whole is tramped with mens feet, and fixed as in the former process. A thousand yards of cloth, yard-broad, require betwixt four and six pecks of bran. The cloth generally lies about three nights and two days in the sour. Others prepare their sour twenty-four hours before, by mixing the bran with warm water in a separate vessel; and before pouring in on the cloth, they dilue it with a sufficient quantity of water. After the cloth is taken from the sour, it ought to be well washed and rinsed again. It is then given to men to be well soaped on a table, and afterwards rubbed betwixt the rubbing-boards. When it comes from them, it should be well milled, and warm water poured on it all the time, if conveniency will allow of it. Two or three of these rubbings are sufficient, and the cloth very seldom requires more.

The lye, after the souring begins, is decreased in strength by degrees; and three boilings after that are commonly sufficient to finish the cloth. Afterwards it is starched, blued, dried, and bittled in a machine made for that purpose, which supplies the place of a calender, and is preferred by many to it.

This method used in the bleaching of our coarse cloths, is very like that practised in Ireland for both fine and coarse. The only material difference is, that there the bleachers use no other ashes but the kelp or cashub. A lye is drawn from the former by cold water, which dissolve the salts, and not the sulphureous particles of the kelp-ashes. This lye is used till the cloth is half whitened, and then they lay aside the kelp-lye for one made of cashub-ashes.

In the preceding history of bleaching we may observe, that it naturally divides itself into several different branches or parts, all tending to give linen the degree of whiteness required. How they effectuate that comes next to be considered.

The general process of bleaching divides itself into these different parts. 1. Steeping and milling. 2. Bucking and boiling. 3. Alternate watering and drying. 4. Souring. 5. Rubbing with soap and warm water, starching, and bluing. We shall treat of these different parts in their order.

Steeping. Green linen, in the different changes which it has undergone before it arrives at that state, contracts a great foulness. This is chiefly communicated to it by the dressing composed of tallow and sowen, which

Bleaching. is a kind of flummery made of bran, flour, or oat-meal feeds. The first thing to be done in the bleachfield is to take off all that filth which is foreign to the flax, would blunt the future action of the salts, and might, in unskilful hands, be fixed in the cloth. This is the design of steeping.

To accomplish this end, the cloth is laid to steep in blood-warm water. A smaller degree of heat would not dissolve the dressing so soon; and the greater might coagulate and fix, in the body of the linen, those particles which we design to carry off. In a few hours the dressing made use in weaving is dissolved, mixed with the water; and as it had acquired some degree of acidity before application, it becomes a species of ferment. Each ferment promotes its own particular species of fermentation or intestine motion; the putrid ferment sets in motion the putrefactive fermentation; the vinous ferment gives rise to the vinous fermentation; and the acid ferment to the acetous fermentation. That there is a real fermentation going on in steeping, one must be soon convinced, who attends to the air-bubbles which immediately begin to arise, to the scum which gathers on the surface, and to the intestine motion and swelling of the whole liquor. That it must be the acetous fermentation, appears from this, that the vegetable particles, already in part soured, must first undergo this process.

The effect of all fermentations is to set the liquor in motion; to raise in it a degree of heat; and to emit air-bubbles, which, by carrying up some of the light oleaginous particles along with them, produce a scum. But as the dressing is in small quantity in proportion to the water, these effects are gentle and slow. The acid salts are no sooner separated, by the acetous fermentation, from the absorbent earth, which made them not perceptible to the tongue in their former state, than they are united to the oily particles of the tallow, which likewise adhere superficially, dissolve them, and render them in some degree miscible with water. In this state they are soon washed off by the intestine motion of the liquor. The consequence of this operation is, that the cloth comes out freed in a great measure from its superficial dirt, and more pliant and soft than what it was.

Whenever this intestine motion is pretty much abated, and before the scum subsides, bleachers take out their cloth. The scum, when no more air-bubbles rise to support it, separates and falls down; and would again communicate to the cloth great part of the filth. But a longer stay would be attended with a much greater disadvantage. The putrid follows close upon the acetous fermentation: when the latter ends the former begins. Were this to take place in any considerable degree, it would render the cloth black and tender. Bleachers cannot be too careful in this article.

The first question that arises to be determined on these principles is, What is the properest liquor for steeping cloth? those used by bleachers are plain water; white linen lye and water, equal parts; and rye-meal or bran mixed with water. They always make use of lye when they have it.

After steeping, the cloth is carried to the putstock-mill, to be freed of all its loose foulness. There can be nothing contrived so effectual to answer the purpose as this mill. Its motion is easy, regular, and safe. While it presses gently, it turns the cloth; which is continu-

all washed with a stream of water. Care must be taken that no water be detained in the folds of the linen, otherwise that part may be damaged.

Bucking and boiling. This is the most important operation of the whole process, and deserves a thorough examination. Its design is to loosen, and carry off, by the help of alkaline lixives or lyes, that particular substance in cloth, which is the cause of its brown colour.

All ashes used in lye, the pearl excepted, ought to be well pounded, before they are put into the copper; for the Marcott and Cashub are very hard, and with some difficulty yield their salt. As these two last contain a very considerable proportion of a real sulphureous matter, which must in some degree tinge white cloth; and as this is dissolved much more by boiling than by the inferior degrees of heat, while the salts may be as well extracted by the latter; the water should never be brought to boil, and should be continued for some time longer under that degree of heat. The pearl-ashes should never be put in till near the end, as they are easily dissolved in water.

If the salts were always of an equal strength, the same quantities would make a lye equally strong; but they are not. Salts of the same name differ very much from one another. The Muscovy ashes are turning weaker every day, as every bleacher must have observed, till at last they turn quite effete. A decoction from them when new, must differ very much from one when they have been long kept. Hence a necessity of some exact criterion to discover when lyes are of an equal strength. The taste cannot serve as that is so variable; cannot be described to another, and is blunted by repeated trials. The proof-ball will serve the purpose of the bleachfield sufficiently; and, by discovering the specific gravity, will show the quantity of alkaline salts dissolved. But it cannot show the dangerous qualities of these salts; for the less caustic and less heavy this liquor is, the more dangerous and corrosive it may be for the cloth.

The third lye, which they draw from these materials by an infusion of cold water, in which the taste of lime is discoverable, appears plainly to be more dangerous than the first. The second lye, which they extract from the same ashes, and which is reckoned about a third in strength, when compared to the first, must be of the same nature; nor should it be used without an addition of pearl-ashes, which will correct it.

It is taken for a general rule, That the solution of any body in its menstruum is equally diffused through the whole liquor. The bleachers depending on this, use equal quantities of the top and bottom of their lye, when once clear and settled; taking it for granted, that there is an equal quantity of salts in equal quantities of the lye. But if there is not, the mistake may be of fatal consequence, as the lye may be in some places stronger than what the cloth can with safety bear. That general law of solution must have taken its rise from particular experiments, and not from reasoning. Whether a sufficient number of experiments have been tried to ascertain this point, and to establish an undoubted general rule, may be called in question.

“But (says Dr Home) when I had discovered that lime makes part of the dissolved substance, and reflected how long its grosser parts will continue suspended in water, there appeared stronger reasons for suspecting

Bleaching. suspecting that this rule, though it may be pretty general, does not take place here; at least it is worth the pursuit of experiment.

"I weighed at the bleachfield a piece of glass in some cold lye, after it had been boiled, stood for two days, and about the fourth part of it had been used. The glass weighed 3 drams $1\frac{1}{2}$ grains in the lye, and 3 drams $7\frac{1}{2}$ grains in river-water. The same glass weighed in the same lye, when almost all used, 2 grains less than it had done before. This shows, that the last of the lye contained a third more of the dissolved body; and, consequently, was a third stronger than the first of the lye.

"As this might, perhaps, be owing to a continuation of the solution of the salts, I repeated the experiment in a different way.

"I took from the surface some of the lye, after the salts were dissolved, and the liquor was become clear. At the same time I immersed a bottle, fixed to a long stick, so near the bottom, as not to raise the ashes there, and, by pulling out the cork by a string, filled the bottle full of the lye near the bottom. The glass weighed in river-water 3 drams $38\frac{1}{2}$ grains; in the lye taken from the surface 3 drams $34\frac{1}{2}$ grains; and in the lye taken from the bottom 3 drams $31\frac{1}{2}$ grains. This experiment shows, that the lye at the bottom was, in this case, $\frac{1}{4}$ th stronger than the lye at the surface.

"At other times when I tried the same experiment, I found no difference in the specific gravity; and therefore, I leave it as a question yet doubtful, though deserving to be ascertained by those who have an opportunity of doing it. As the lye stands continually on the ashes, there can be no doubt but what is used last must be stronger than the first. I would therefore recommend, to general practice, the method used by Mr John Christie, who draws off the lye, after it has settled, into a second receptacle, and leaves the ashes behind. By this mean it never can turn stronger; and he has it in his power to mix the top and bottom, which cannot be done so long as it stands on the ashes."

Having considered the lye, let us next inquire how it acts. On this inquiry depends almost the whole theory of bleaching, as its action on cloth is, at least in this country, absolutely necessary. It is found by experiment, that one effect they have on cloth is the diminishing of its weight; and that their whitening power is, generally, in proportion to their weakening power. Hence arises a probability, that these lyes act by removing somewhat from the cloth, and that the loss of this substance is the cause of whiteness. This appears yet plainer, when the bucking, which lasts from Saturday night to Monday morning, is attended to.

There are various and different opinions with regard to the operations of these salts: that they act by altering the external texture of the cloth, or by separating the mucilaginous parts from the rest, or by extracting the oil which is laid up in the cells of the plant. The last is the general opinion, or rather conjecture, for none of them deserves any better name; but we may venture to affirm, that it is so without any better title to pre-eminence than what the others have. Alkaline salts dissolve oils, therefore these salts dissolve the cellular oil of the cloth, is all the foundation which this

theory has to rest on; too slight, when unsupported Bleaching. by experiment, to be relied on.

Dr Home endeavours to settle this question by the following experiments and observations.

"Wax (says he) is whitened by being exposed to the influence of the sun, air, and moisture. A discovery of the change made on it by bleaching may throw a light upon the question.

"Six drams of wax were sliced down, exposed on a south window, September 10. and watered. That day being clear and warm, bleached the wax more than all the following. It seemed to me to whiten quicker when it had no water thrown on it than when it had. September 15. it was very white, and 1 dram 3 grains lighter. $3\frac{1}{2}$ drams of this bleached wax, and as much of unbleached, taken from the same piece, were made into two candles of the same length and thickness, having cotton wicks of the same kind. The bleached candle burnt 1 hour 33 minutes; the unbleached 3 minutes longer. The former run down four times, the latter never. The former had an obscure light and dull flame; the latter had a clear pleasant one, of a blue colour at the bottom. The former when burning seemed to have its wick thicker, and its flame nearer the wax than the latter. The former was brittle, the latter not. It plainly appears from these facts, that the unbleached wax was more inflammable than the bleached; and that the latter had lost so much of an inflammable substance as it had lost in weight; and consequently the substance lost in bleaching of wax is the oily part.

"As I had not an opportunity of repeating the former experiment, I do not look on it as entirely conclusive; for it is possible that some of the dust, flying about in the air, might have mixed with the bleached wax, and so have rendered it less inflammable. Nor do I think the analogical reasoning from wax to linen without objections. Let us try then if we cannot procure the substance extracted from the cloth, show it to the eye, and examine its different properties. The proper place to find it is in a lye already used, and fully impregnated with these colouring particles.

"I got in the bleachfield some lye, which had been used all that day for boiling coarse linen, which was tolerably white, and had been twice boiled before. There could be no dressing remaining in these webs. No soap had ever touched that parcel; nor do they mix soap with the lye used for coarse cloth. Some of this impregnated lye was evaporated, and left a dark coloured matter behind. This substance felt oily betwixt the fingers, but would not lather in water as soap does. It deflagrated with nitre in fusion, and afforded a tincture to spirit of wine. By this experiment the salts seem to have an oily inflammable substance joined with them.

"Could we separate this colouring substance from these salts, and exhibit it by itself, so that it might become the object of experiment, the question would be soon decided. Here chemistry lends us its assistance. Whatever has a stronger affinity or attraction to the salts with which it is joined than this substance has, must set it at liberty, and make it visible. Acids attract alkaline salt from all other bodies; and therefore will serve our purpose.

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"Into a quantity of the impregnated lye mentioned in the former experiment, I poured in oil of vitriol. Some bubbles of oil arose, and intestine motion was to be perceived, and the liquor changed its colour from a dark to a turbid white. It curdled like a solution of soap, and a scum soon gathered on the surface, about half an inch in thickness, the deepness of the liquor not being above six inches. What was below was now pretty clear. A great deal of the same matter lay in the bottom; and I observed that the substance on the surface was precipitated, and showed itself heavier than water, when the particles of air, attached to it in great plenty, were dispelled by heat. This substance was in colour darker than the cloth which had been boiled in it.

"I procured a considerable quantity of it by skimming it off. When I tried to mix it with water, it always fell to the bottom. When dried by the air, it diminished very much in its size, and turned as black as a coal. In this state it deflagrated strongly with nitre in fusion; gave a strong tincture to spirit of wine; and when put on a red-hot iron, burnt very slowly, as if it contained a heavy ponderous oil; and left some earth behind.

"From the inflammability of this substance, its rejecting of water, and dissolving in spirit of wine, we discover its oleaginous nature; but from its great specific gravity we see that it differs very much from the expressed or cellular oil of vegetables; and yet more from their mucilage. That it dissolves in spirit of wine, is not a certain argument of its differing from expressed oils; because these, when joined to alkaline salts, and recovered again by acids, become soluble in spirit of wine. The quantity of earthy powder left behind after burning, shows that it contains many of the solid particles of the flax. The substance extracted from cloth by alkaline lyes appears then to be a composition of a heavy oil, and the solid earthy particles of the flax.

"In what manner these salts act so as to dissolve the oils, and detach the solid particles, is uncertain; but we see evidently how much cloth must be weakened by an improper use of them, as we find the solid particles themselves are separated."

It is necessary that cloth should be dry before bucking, that the salts may enter into the body of the cloth along with the water; for they will not enter in such quantity if it be wet; and by acting too powerfully on the external threads, may endanger them.

The degree of heat is a very material circumstance in this operation. As the action of the salts is always in proportion to the heat, it would appear more proper to begin with a boiling heat, by which a great deal of time and labour might be saved. The reason why this method is not followed appears to be this. If any vegetable or vegetable substance is to be softened and to have its juices extracted, it is found more proper to give it gentle degrees of heat at first, and to advance gradually, than to plunge it all at once in boiling water. This last degree of heat is so strong, that when applied at once to a vegetable it hardens instead of softening its texture. Dried vegetables are immediately put into boiling water by cooks, that these substances may preserve their green colour, which is only to be done by hindering them from turning too

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soft. Boiling water has the same effect on animal substances; for if salt beef is put into it, the water is kept from getting at the salts from the outside of the beef being hardened.

But when we consider how much of an oily substance there is in the cloth, especially at first, which will for some time keep off the water, and how the twisting of the threads, and closeness of the texture, hinders the water from penetrating, we shall find, that if boiling water were put on it at once, the cloth might be liable, in several parts, to a dry heat, which would be much worse than a wet one. That the lyes have not access to all parts of the cloth at first, appears plainly from this, that when it has lain, after the first bucking, till all the lyes are washed out, it is as black, in some parts, as when it was steeped. This must be owing to the discharge of the colouring particles from those places to which the lye has access, and to their remaining where it has not. It would seem advisable then, in the first bucking or two, when the cloth is foul, to use the lye considerably below the boiling point; that by this soaking or maceration, the foulness may be entirely discharged, and the cloth quite opened for the speedy reception of the boiling lye in the buckings which follow.

The lyes should likewise be weakest in the first buckings, because then they act only on the more external parts; whereas, when the cloth is more opened, and the field of action is increased, the active powers ought to be so too. For this reason they are at the strongest after some sourings.

The only thing that now remains to be considered, is, the management of the coarse cloth, where boiling is substituted in place of bucking. This species of linen cannot afford the time and labour necessary for the latter operation; and therefore they must undergo a shorter and more active method. As the heat continues longer at the degree of boiling, the lyes used to the coarse cloth must be weaker than those used to the fine. There is not so much danger from heat in the coarse as in the fine cloth, because the former is of a more open texture, and will allow the lye to penetrate more speedily. In the close kinds, however, the first application of the salts should be made without a boiling heat.

Alternate watering and drying. After the cloth has been bucked, it is carried out to the field, and frequently watered for the first six hours. For if, during that time, when it is strongly impregnated with salts, it is allowed to dry, the salts approaching closer together, and assisted by a greater degree of heat, increasing always in proportion to the dryness of the cloth, act with greater force, and destroy its very texture. After this time, dry spots are allowed to appear before it gets any water. In this state it profits most, as the latter part of the evaporation comes from the more internal parts of the cloth, and will carry away most from those parts. The bleaching of the wax, in a preceding experiment, helps to confirm this; for it seemed to whiten most when the last particles of water were going off.

This continual evaporation from the surface of the cloth shows, that the design of the operation is to carry off somewhat remaining after the former process of bucking. This appears likewise from a fact known to

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Bleaching all bleachers, that the upper side of cloth, where the evaporation is strongest, attains to a greater degree of whiteness than the under side. But it is placed beyond all doubt by experiment, which shows, that cloth turns much lighter by being exposed to the influence of the sun, air, and winds, even though the salts have been washed out of it.

What, then, is this substance? As we have discovered in the former section, that the whitening, in the operation of bucking, depends on the extracting or loosening the heavy oil, and solid particles of the flax; it appears highly probable, that the effects of watering, and exposition to the sun, air, and winds, are produced by the evaporation of the same substance, joined to the salts, with which composite body the cloth is impregnated when exposed on the field. That these salts are in a great measure carried off or destroyed, appears from the cloth's being allowed to dry without any danger after the evaporation has gone on for some time. "If we can show (says Dr Home) that oils and salts, when joined together, are capable of being exhaled, in this manner, by the heat of the atmosphere, we shall reduce this question to a very great degree of certainty.

"September 10. I exposed in a south-west window half an oz. of Castile soap, sliced down and watered. September 14. when well dried, it weighed but 3 dr. 6 gr. September 22. it weighed 2 dr. 2 gr. September 24. it weighed 1 dr. 50 gr. It then seemed a very little whiter; but was much more mucilaginous in its taste, and had no degree of saltiness which it had before.

"It appears from this experiment, that soap is so volatile, when watered, and exposed to air not very warm, that it loses above half its weight in 14 days. The same must happen to the saponaceous substance, formed from the conjunction of the alkaline salts, heavy oil, and earthy particles of the flax. The whole design, then, of this operation, which by way of pre-eminence, gets the name of *bleaching*, is to carry off, by the evaporation of water, whatever has been loosened by the former process of bucking.

"Against this doctrine there may be brought two objections, seemingly of great weight. It is a general opinion amongst bleachers, that linen whitens quicker in March and April than in any other months: but as the evaporation cannot be so great at that time as when the sun has a greater heat; hence the whitening of cloth is not in proportion to the degree of evaporation; and therefore the former cannot be owing to the latter. This objection vanishes, when we consider, that the cloth that comes first into the bleachfield, in the spring, is closely attended, having no other to interfere with it for some time; and as it is the whitest, gets, in the after-buckings, the first of the lye; while the second parcel is often bucked with what has been used to the first. Were the fact true, on which the objection is founded, this would be a sufficient answer to the objection. But it appears not to be true, from an observation of Mr John Christie, That cloth laid down in the beginning of June, and finished in September, takes generally less work, and undergoes fewer operations, than what is laid down in March, and finished in June.

"The other objection is, That cloth dries much faster in windy weather than in calm sun shine; but it

does not bleach so fast. This would seem to show, that the sun has some particular influence independent on evaporation. In answer to this objection, let it be considered, that it is not the evaporation from the surface, but from the more internal parts, that is of benefit to the cloth. Now, this latter evaporation must be much stronger in sunshine than in windy weather, on account of the heat of the sun, which will make the cloth more open; while the coldness of windy weather must shut it up, so that the evaporation will all be from the surface. Clear sunshine, with a very little wind, is observed to be the best weather for bleaching; a convincing proof that this reasoning is just.

"It would seem to follow as a corollary from this reasoning, that the number of waterings should in general be in proportion to the strength of the lye; for the stronger the lye is, the more there is to be evaporated; and the greater the danger, in case the cloth should be allowed to dry. But there is an exception to this general rule, arising from the consideration of another circumstance. It is observed, that cloth when brown, dries sooner than when it becomes whiter, arising from the closeness and oiliness which it then has not allowing the water a free passage. Perhaps that colour may retain a greater degree of heat, and in that way assist a very little. Cloth therefore, after the first buckings, must be more carefully watered than after the last.

"It follows likewise from this reasoning, that the soil of the bleachfield should be gravelly or sandy, that the water may pass quickly through it, and that the heat may be increased by the reflection of the soil, for the success of this operation depends on the mutual action of heat and evaporation. It is likewise necessary that the water should be light, soft, and free from mud or dirt, which not being able to rise along with the water, must remain behind. When there is much of this, it becomes necessary to rinse the cloth in water, and then give it a milling, to take out the dirt; else it would be fixed in the cloth by the following bucking, as it is not soluble by the lye.

"This operation has more attributed to it by bleachers than it can justly claim. The cloth appears, even to the eye, to whiten under these alternate waterings and dryings; and these naturally get the honour of it, when it more properly belongs to the former operation. Here lies the fallacy. Alkaline salts give a very high colour to the decoctions or infusion of vegetables. This is probably owing to the solution of the oleaginous colouring particles of the plant; which particles, being opened and separated by the salts, occupy a greater space, and give a deep colour to the liquor. The cloth participates of the liquor and colour. Hence bleachers always judge of the goodness of the bucking by the deepness of its colour. The rule, in general, is good. I observe that in those buckings which continue from the Saturday night to the Monday morning, the cloth has always the deepest colour. When that cloth has been exposed some hours to the influence of the air, these colouring particles which are but loosely attached to it, are evaporated, and the linen appears of a brighter colour. This operation does no more than complete what the former had almost finished. If its own merit were thoroughly known, there would be no occasion to attribute that of another operation to it. Thread, and open cloths, such as diaper, may be reduced to a great degree

Bleaching degree of whiteness, after one bucking, by it alone. No cloth, as would appear, can attain to a bright whiteness without it.

"Since the only advantage of watering is the removal of the salts, and what they have dissolved, might we not effectuate this by some cheaper and more certain method? For it occupies many hands; and must depend altogether on the uncertainty of the weather; so that in the beginning of the season, the bleacher is often obliged to repeat his buckings without bleaching. We might take out the alkaline salts by acids; but then the other substance would be left alone in the cloth, nor would any washing be able to remove it. Mill-washing appears a more probable method of taking out both salts and oils; and it would seem that this might in a great measure supply the place of watering; but upon trial it does not succeed. Two parcels of linen were managed equally in every other respect, except in this, that one was watered, and exposed to the influence of the air, and the other was only mill-washed. This method was followed until they were fit for souring. The cloth which had been mill-washed had a remarkable green colour, and did not recover the bright colour of the pieces managed in the common way, until it had been treated like them for a fortnight. The green colour was certainly owing to a precipitation of the sulphureous particles, with which the lye is impregnated, upon the surface of the cloth; owing to the salts being washed off more speedily than the sulphur, to which they are united in the lye. The attachment betwixt these two bodies we know is very loose, and the separation easily made. Evaporation then alone is sufficient to carry off these sulphureous particles."

Souring. It is well known to all chymists, that alkaline salts are convertible, by different methods, into absorbent earths. Frequent solution in water, and evaporation of it again, is one of these. This transmutation then of these salts, which are not volatilised or washed away, must be continually going on in the cloth under these alternate waterings and dryings of the former process; not much indeed after the first two or three buckings; because the salts, not having entered deep into the cloth, are easily washed off, or evaporated. But when they penetrate into the very composition of the last and minutest fibres, of which the first vessels are made, they find greater difficulty of escaping again, and must be more subject to this transmutation. But if we consider the bleaching ashes as a composition of lime and alkaline salts, we must discover a fresh fund for the deposition of this absorbent earth. The common caustic, a composition of this very kind, soon converts itself, if exposed to the open air, into a harmless earthy powder.

Frequent buckings and bleachings load the cloth with this substance. It becomes then necessary to take it out. No washing can do that, because earth is not soluble in water. Nothing but acids can remove it. These are attracted by the absorbent earth, join themselves to it, and compose a kind of neutral imperfect salt, which is soluble in water, and therefore easily washed out of the cloth. The acid liquors commonly used are butter-milk, which is reckoned the best, sour-milk, infusion of bran, rye-meal, &c. kept for some days till they sour. Sour whey is thought to give the cloth a yellow colour.

Bleaching The linen ought to be dried before it is put in the sour, that the acid particles may penetrate, along with the watery, through the whole. A few hours after it has been there, air-bubbles arise, the liquor swells, and a thick scum is formed; manifest signs of a fermentation. The following experiment, says Dr Home, shows the degree of heat which attends it.

"May 25. I put a thermometer of Fahrenheit's into some butter-milk, of which the bleachers were composing their sours, and which stood in a vat adjoining to another, where the milk was the same, and the souring process had been going on for two days. After the thermometer had been 20 minutes in the butter-milk, the mercury stood at 64 degrees. In the souring vat it rose to 68 degrees. An increase of four degrees shows a pretty brisk intestine motion.

"To what are all these effects owing? To the acetous fermentation going on in those vegetable liquors, whose acids, extricating themselves, produce heat, intestine motion, and air-bubbles. As the change is slow, the process takes five or six days before it is finished. During this time the acid particles are continually uniting themselves to the absorbent earth in the cloth. That this fermentation goes on in the liquor alone, appears from this consideration, that the same effects, viz. air-bubbles and scum, are to be seen in the butter-milk alone. The only effect then it has is, by the small degree of heat, and intestine motion, which attend it, to assist the junction of the acid and absorbent particles. We shall presently see that this process may be carried on to as great advantage, without any fermentation; and therefore it appears not absolutely necessary.

"When these absorbent particles are fully saturated, the remaining acids may unite with, and have some small effect in extracting the colouring particles. This appears from the two following experiments.

"Sept. 20. A piece of cloth which had been steeped, weighing $41\frac{1}{2}$ gr. was put into a half pound of butter-milk, whigged, and well soured, by a mixture of water, and by boiling. Sept. 24. When taken out, and washed in water, it appeared a very little whiter. The mineral acids, as will appear afterwards, whiten cloth, even though they are very much diluted.

"Just before the acetous fermentation is finished, the cloth should be taken out; otherwise the scum will fall down and lodge in the cloth, and the putrefaction which then begins will weaken it. This appears from the following experiment.

"Sept. 16. A piece of cloth weighing 42 gr. was laid in butter-milk unwhigged. Novem. 15. The milk had a putrefied smell. The cloth was a little whiter, but very tender; and weighed, when well washed in warm water and dried, 40 gr."

All the sours made of bran, rye-meal, &c. ought to be prepared before use; for by this means so much time will be saved. Besides, when the water is poured upon the cloth and bran, as is done in the management of coarse cloth, the linen is not in a better situation than if it had been taken up wet from the field; and by this means the acid particles cannot penetrate so deep. Again, this method of mixing the bran with the cloth, may be attended with yet worse consequences. All vegetable substances, when much pressed,

Bleaching. ed, fall into the putrescent, and not the acetous, fermentation. This often happens to be the bran pressed betwixt the different layers on the linen, which must weaken the cloth. Hence, all sours should be prepared before the cloth is steeped in them; and none of the bran or meal should be mixed with the cloth.

The sours are used strongest at first, and gradually weakened till the cloth has attained to its whiteness. In the first sourings, there is more of the earthy matter in the cloth, from the many buckings it has undergone, than what there can be afterwards. As the quantity of this matter decreases, so should the strength of the sour. There is not, however, the least danger, at any time, from too strong a sour.

What is most wanted in this operation is a more expeditious and cheaper method of obtaining the same end. As it takes five or six days, it retards the whitening of the cloth considerably; and as bleachers are obliged to send for milk to a great distance, it becomes very dear. This last consideration makes them keep it so long, that, when used, it can have no good effect; perhaps it may have a bad one.

There is one consideration that may lead us to shorten the time. It is observed, that the souring process is sooner finished in warm than in cold weather. Heat quickens the fermentation, by aiding the intestine motion. The vats therefore should not be buried in the ground, as they always are, which must keep them cold; there should rather be pipes along the walls of the room, to give it that degree of heat which, on trial, may be found to answer best. There are few days in summer so hot as is necessary; and the beginning and end of the season is by much too cold. That this is no ideal scheme, the following fact is a sufficient proof. There are two vats in Salton bleachfield, adjoining to a partition wall, at the back of which there is a kitchen-fire. In these vats the souring process is finished in three days, whereas it lasts five or six days in the other placed round the same room.

This improvement, tho' it shortens the time of souring a very little, yet is no remedy against the scarcity and dearness of milk sours. Such a liquor as would serve our purpose, must be found either among the vegetable acids, which have no further fermentation to undergo, or among the mineral acids. The former are a large class, and contain within themselves many different species; such as the acid juice of several plants, vinegars made of fermented liquors, and acid salts, called *tartars*. But there is one objection against these vegetable acids: they all contain, along with the acid, a great quantity of oily particles, which would not fail to discolour the cloth. Besides, the demand of the bleachfields would raise their price too high.

The mineral acids have neither of these objections. They are exceedingly cheap, and contain no oil. "I will freely own (says Dr Home), that at first I had no great opinion of success from the mineral, from two reasons; their want of all fermentation, which I then looked on as necessary; and their extreme corrosiveness. But the experience of two different summers, in two different bleachfields, has convinced me, that they will answer all the purposes of the milk and bran sours; nay, in several respects be much preferable to them. I have seen many pieces of fine cloth, which had no other

Bleaching. sours but those of vitriol, and were as white and strong as those bleached in the common way. I have cut several webs through the middle, and bleached one half with milk and the other with vitriol; gave both the same number of operations, and the latter were as white and strong as the former."

The method in which it has been hitherto used is this. The proportion of the oil of vitriol to the water, with which it is diluted, is half an ounce, or at most three quarters, to a gallon of water. As the milk-sours are diminished in strength, so ought the vitriol-sours. The whole quantity of the oil of vitriol to be used, may be first mixed with a small quantity of water, then added to the whole quantity of water, and well mixed together. The water should be milk-warm; by which means the acid particles will penetrate further, and operate sooner. The cloth should then be put dry into the liquor.

It is observed, that this sour performs its task much sooner than those of milk and bran; so that Mr John Christie, in making the trial, used to lay the milk-sours 24 hours before the vitriol. Five hours will do as much with this sour as five days with the common sort. But the cloth can receive no harm in allowing it to remain for some days in the sour; but rather, on the contrary, an advantage. The cloth is then taken out, well rinsed, and mill-washed in the ordinary way.

The liquor, while the cloth lies in this sour, is less acid the second day than the first, less the third than the second, and so diminishes by degrees. At first it is clear, but by degrees a mucilaginous substance is observed to float in it, when put into a glass. This foulness increases every day. This substance, extracted by the acid, is the same with what is extracted by the alkaline salts; and blunts the acidity of the former, as it does the alkalescency of the latter. Hence the liquor loses by degrees its acidity. But as the acid salts do not unite so equally with oily substance as the alkaline do, the liquor is not so uniformly tinged in the former as in the latter case, and the mucous substance presents itself floating in it.

It is observed, that in the first souring, which is the strongest, the liquor, which was a pretty strong acid before the cloth was put in, immediately afterwards becomes quite vapid; a proof how very soon it performs its task. But in the following operations, as the linen advances in whiteness, the acidity continues much longer; so that in the last operation the liquor loses very little of its acidity. This happens although the first buckings after the first sourings are increased in strength, while the sours are diminished. There are two causes to which this is owing. The texture of the cloth is now so opened, that although the lyes are strong, the alkaline salts and absorbent earth are easily washed out; and the oily particles are in a great measure removed which help to blunt the acidity of the liquor.

Two objections are made against the use of vitriol-sours. One is, that the process of souring with milk is performed by a fermentation; and as there is no fermentation in the vitriol-sours, they cannot serve the purpose so well: the other, that they may hurt the texture of the cloth. The answer to the former objection is very short; that the vitriol-sours operate successfully without a fermentation, as experience shows; and therefore in them a fermentation is not necessary.

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As to the latter objection, that oil of vitriol, being a very corrosive body, may hurt the cloth; that will vanish likewise, when it is considered how much the vitriol is diluted with water, that the liquor is not stronger than vinegar, and that it may be safely taken into the human body.

That it may be used with safety, much stronger than what is necessary in the bleachfield, appears from the following experiment with regard to the stamping of linen. After the linen is boiled in a lye of ashes, it is bleached for some time. After this, in order to make it receive the colour, it is steeped in a sour of water and oil of vitriol, about 15 times stronger than that made use of in the bleachfield; for to 100 gallons of water are added two and a half of oil of vitriol. Into this quantity of liquor, made so warm as the hand can just be held in it, is put seven pieces of 28 yards each. The linen remains in it about two hours, and comes out remarkably whiter. The fine cloth often undergoes this operation twice. Nor is there any danger if the oil of vitriol is well mixed with the water. But if the two are not well mixed together, and the oil of vitriol remains in some parts undiluted, the cloth is corroded into holes.

Let us now take a view of the advantages which the vitriol-sours must have over the milk. The latter is full of oily particles, some of which must be left in the cloth; but the case is worse when the scum is allowed to precipitate upon the cloth. The former is liable to neither of these objections.

The common sours hasten very fast to corruption; and if, from want of proper care, they ever arrive at that state, must damage the cloth very much. As the milk is kept very long, it is often corrupted before it is used; and without acting as a sour, has all the bad effects of putrefaction. The vitriol-sours are not subject to putrefaction.

The milk takes five days to perform its task; but the vitriol-sours do it in as many hours; nay, perhaps as many minutes. Their junction with the absorbent particles in the cloth must be immediate, whenever these acid particles enter with the water. An unanswerable proof that the fact is so, arises from the circumstances which happen when the cloth is first steeped in the vitriol-sour; the cloth has no sooner imbibed the acid liquor, than it loses all acidity, and becomes immediately vapid. This effect of vitriol-sours must be of great advantage in the bleachfield, as the bleachers are at present hindered from enjoying the season by the tediousness of the souring process. The whole round of operations takes seven days; to answer which they must have seven parcels, which are often mixing together, and causing mistakes. As three days at most will be sufficient for all the operations when vitriol-sours are used, there will be no more than three parcels. The cloth will be kept a shorter time in the bleachfield, and arrive sooner at market.

The milk sours are very dear, and often difficult to be got; but the vitriol are cheap, may be easily procured, and at any time.

There is yet another advantage in the use of vitriol, and that is its power of whitening cloth. Even in this diluted state, its whitening power is very considerable. We have already seen, that it removes the same colouring particles which the alkaline lyes do. What

of it then remains, after the alkaline and absorbed particles are neutralized in the cloth, must act on these colouring particles, and help to whiten the cloth. That this is really the case, appears from the following fact. Mr Christie being obliged to choose 20 of the whitest pieces out of 100, five of the twenty were taken out of seven pieces which were bleached with vitriol.

From both experience and reason, it appears, that it would be for the advantage of our linen-manufacture to use vitriol in place of milk-sours.

Hand-rubbing with soap and warm water, rubbing-boards, starching, and bluing.—After the cloth comes from the souring, it should be well washed in the washing-mill, to take off all the acid particles which adhere to its surface. All acids decompose soap, by separating the alkaline salts and oily parts from one another. Were this to happen on the surface of the cloth, the oil would remain; nor would the washing-mill afterwards be able to carry it off.

From the washing-mill the fine cloth is carried to be rubbed by women's hands, with soap and water. As the liquors, which are generally employed for souring, are impregnated with oily particles, many of these must lodge in the cloth, and remain, notwithstanding the preceding milling. It is probable, that all the heavy oils are not evaporated by bleaching. Hence it becomes necessary to apply soap and warm water, which unite with, dissolve, and carry them off. It is observed, that if the cloth, when it is pretty white, gets too much soap, the following bleaching is apt to make it yellow; on that account they often wring out the soap.

It is a matter worth inquiring into, whether hard or soft soap is best for cloth. Most bleachers agree, that hard soap is apt to leave a yellowness in the cloth. It is said, that the use of hard soap is discharged in Holland. As there must be a considerable quantity of sea-salt in this kind, which is not in the soft, and as this salt appears prejudicial to cloth, the soft soap ought to be preferred.

The management of the coarse cloth is very different, in this operation, from fine. Instead of being rubbed with hands, which would be too expensive, it is laid on a table, run over with soap, and then put betwixt the rubbing-boards, which have ridges and grooves from one side to another, like teeth. These boards have small ledges to keep in the soap and water, which saves the cloth. They are moved by hands or a water-wheel, which is more equal and cheaper. The cloth is drawn by degrees through the boards, by men who attend; or which is more equal and cheaper, the same water-wheel moves two rollers, with ridge and groove, so that the former enters the latter, and by a gentle motion round their own axis pull the cloth gradually through the boards.

This mill was invented in Ireland about thirty years ago. The Irish bleachers use it for their fine as well as coarse cloth. These rubbing-boards were discharged some years ago in Ireland, by the trustees for the manufactures of that country, convinced from long experience of their bad effects. But as proper care was not taken to instruct the bleachers by degrees in a safer method, they continued in the old, made a party, and kept possession of the rubbing-boards. There were considerable improvements made in them in this country;

such

Bleaching.

Bleaching. Such as the addition of the ledges, to keep the cloth moist; and of the rollers, which pull the cloth more gradually than mens hands. These improvements were first made in Salton bleachfield.

The objections against these rubbing-boards are unanswerable. By rubbing on such an unequal surface, the solid fibrous part of the cloth is wore; by which means it is much thinned, and in a great measure weakened before it comes to the market. As a proof of this, if the water which comes from the cloth in the rubbing-boards be examined, it will be found full of cottony fibrous matter. These boards give the cloth a cottony surface, so that it does not keep long clean. Again, they flatten the threads, and take away all that roundness and firmness which is the distinguishing property of cloth bleached in the Dutch method.

For these reasons they must be very prejudicial to fine cloth, and should never be used in bleaching it. As they seem to be in some measure necessary to lessen the expence of bleaching coarse linen, they ought never to be used above twice, or thrice at most. They might be rendered much more safe, by lining their insides with some soft elastic substance, that will not wear the cloth so much as the wooden teeth do. Mr Christie at Perth has lined his boards with short hair for some years past, and finds that it answers very well.

After the coarse cloth has undergone a rubbing, it should be immediately milled for an hour, and warm water poured now and then on it to make it lather. This milling has very good effects; for it cleans the cloth of all the dirt and filth which the rubbing-boards have loosened, and which, at the next boiling, would discolour the cloth. Besides, it is observed, that it makes the cloth less cottony, and more firm, than when whitened by rubbing alone.

The last operation is that of starching and bluing. It often happens, that the cloth, when exposed to the weather to be dried after this operation, gets rain: which undoes all again, and forces the bleacher to a new expence. To remedy this inconvenience, Mr Christie, some years ago, invented the dry-house, where the cloth may be dried, after this operation, in any weather. This invention meets with universal approbation.

A method of bleaching safely with lime.—Dr Home has found by repeated trials, that alkaline salts added to lime, diminish its power of weakening and corroding cloth; and that in proportion to the quantity of these salts added to the lime. This composition, as it is not so dangerous as lime alone, so it is not so expeditious in whitening. When equal parts of each are used, the whitening power is strong, and the weakening power not very considerable; so that they might be used with safety to bleach cloth, in the proportion of one part of lime to four of pure alkaline salts. This fully accounts for an observation made by all bleachers, That the bleaching salts, when mixed together, operate safer and better than when used separately. For the corrosive power of the Muscovy, Marcock, and Cashub ashes, is corrected by the pearl ashes, and the whitening quality of the latter is increased by that of the former.

There is not a more corroding substance, with regard to animals, than alkaline salts and lime joined together, especially when fused in the fire. This is the compo-

sition of the common caustic. But lime, and lime-water alone, preserve animal substances in a sound entire state. It appears then surprising, that salts and lime should be found so little destructive of cloth, when lime, or lime-water alone, destroys it so remarkably. But that this is a fact, is made evident by many experiments, and has been practised both with success and safety, by a bleacher who gives the following account of his method of bleaching with lime.

“First (says he) I steep the cloth in warm water for 24 hours; then clean it in a washing-mill, of all the dressing, or sowen, as the vulgar term it. Afterwards I buck cloth with cow-dung and water, and bleach it with this for three days; then clean it again, and boil it with a lye made of Cashub ashes. A pound to each piece of 18 or 20 yards long is sufficient. This I do twice, as no lime ought to be given to cloth before it is a full third whitened; as it by no means advances the whitening of the cloth, but, on the contrary, protracts it: For, instead of loosening the oil and dirt in the cloth, when brown, it rather fixes them; just as when fine cloth is bucked with over-warm lyes in the first buckings. Lime is by no means fit for discharging the oil in the cloth, but for cleansing it of the dead part, commonly called *sprat*. The cloth, being cleaned, is laid upon a dreeper. It must not be drier before bucking with lime, otherwise it will take in more than can be got out again before the next application: for as I have observed already, that lime is only fit for discharging the dead part, bucking thus wet makes it rest on the outside of the cloth. I take a lippy of the finest and richest powdered lime that can be got, of the brightest white colour, as poor lime does more hurt than good, to thirty pieces of the above length; and make a cold lye of it, by stirring and pouring water off the lime, until all be dissolved but the dross, which is thrown away: then I add a little soap, which makes the lye have the nearest resemblance to milk that breaks in boiling, of any thing I can think of: for this soap blunts the hotness of the lime. Then I take the cloth and dip it in the lime-lye, and that moment out again, and lay it on a dreeper until it be bucked; then put it on the field, watering it carefully; for if allowed to dry, it is much damaged. This is done always in the morning; as it cannot be done at night, in regard of the hot quality of the lime, which soon heats the cloth and tenders it. If a hot sun-shine follows, it has great effect; for lime is just like all other materials for bleaching, that have more or less effect according as the weather is good or bad. I take it up the second day after bucking, and give it a little milling, or hand-rubbing, or bittling, commonly called *knocking*; and lay it on the field again, watering it carefully as before. The effect is more visible the second than the first day. As all cloth when limed should have a great deal of work, otherwise more than half the effect is lost; and not only that, but a great deal of labour and pains is requisite to take the lime out of the cloth again; it must never be exposed on the Sabbath day, but carefully kept wet always while used in this way. Thus bucking for three or four times at most, is sufficient for any cloth, except that made of flax pulled either over-green, or which grows in a drouthy season, or perhaps not so well heckled as it should be. This sort occasions great trouble and expence to the bleacher. But the most

Bleaching. most effectual and expeditious way I ever found for this kind was, after boiling, to take a little of the warm lye, and mix a very small quantity of lime with it, and draw the cloth through that as hot as possible, and put it on the field directly, watering it carefully. This will clean it of the sprat surprisngly. Then I boil it with pearl ashes, and give it the last boil with soap.

"There are innumerable mistakes in the use of lime committed by the vulgar, who are ignorant of its quality and effects. They know only this in general, that it is a thing which whitens cloth cheap, and is easily purchased; therefore they will use it. Some of them begin whitening of their cloth with it, which I have already observed to be wrong, and given reasons for it, and continue it until the cloth is bleached; give it a boil or two at most, and then wash it up while the gross body of the lime is in the substance of the cloth. This makes limed cloth easily distinguishable from unlimed, as the former has a yellowish colour, and is full of a powder. Besides, as lime is of a very hot corroding nature, it must by degrees weaken the cloth. The bad effects of this substance do not end here. When the cloth is put on board, it contracts a dampness, which not only makes it yellow, and lose any thing of colour it has, but directly rots it. And although it should escape this, which it is possible it may, by a quick and speedy passage; yet whenever it is put in any warehouse, it will meet with moisture there, especially if the winter season should come on before it is disposed or made use of. These I take to be the principal reasons for so much complaint in bleaching with this material."

The whole art and safety in using the lime, according to this method, depends on the junction of the alkaline salts, during the bucking, to the particles of lime which were on the surface of the cloth.

As the operation of bleaching depends on the extraction of a certain quantity of phlogistic matter from the cloth, it is natural to suppose that it might be accelerated by rendering the alkali very caustic. Thus the salt would be entirely freed from the incumbrance of fixed air, with which in the usual experiments of chemistry it appears to have a greater affinity than with oil; for soap may be partially decomposed by fixed air, nor can it be prepared without an exceedingly caustic alkaline lye. In this light the matter has appeared to some very eminent chemists; and Dr Black thought it of importance sufficient to publish printed directions to the practical bleachers how to render their alkali sufficiently caustic with lime, and at the same time recover it from the chalky residuum with as little loss as possible. This method has accordingly been tried; but is not found altogether to answer the sanguine expectations at first raised by the proposal. It is found that in the large way of operating, fixed alkali quits the fixed air to unite with the oily or other matter to be extracted from the cloth. The only advantage therefore to be gained by Dr Black's improvement is, that the action of the alkali is thus quickened, and some quantity of fuel saved; but this is not, by the bleachers, reckoned an equivalent to the trouble of rendering the alkali caustic, unless in places where fuel is very scarce.

The use of acids in bleaching was formerly in a great measure unaccounted for; but from the late disco-

veries concerning the use of dephlogisticated spirit of salt in this art, it appears probable that they act by means of the dephlogisticated air they contain. This, however, is not always the case; for silk is rendered yellow by the action of dephlogisticated air, though rendered white by the action of the volatile sulphureous acid, which undoubtedly contains a portion of this kind of air, though much less than the concentrated vitriolic. The nitrous acid, which contains a great quantity of dephlogisticated air, likewise communicates a yellow colour to silk; and indeed seems very much inclined to produce this colour upon all the substances it touches. At any rate, its price would be a sufficient objection against its use in bleaching. The spirit of salt in its common state is said by M. Berthollet to be used with success by some bleachers in France instead of the vitriolic; but such experiments as have been made upon it in this country have not answered the purpose. The new method of bleaching is founded upon that remarkable property which dephlogisticated spirit of salt possesses of destroying vegetable colours; and various attempts have been made to introduce it into practice, though in this country the difficulties or disadvantages attending it have prevented it from coming into general use. M. Scheele was the inventor of this substance; but M. Berthollet seems to have been the first who attempted to apply it to the practice of bleaching. In consequence of his observations, a treatise has appeared on the new method of bleaching, collected and translated from his works by Mr Kerr surgeon in Edinburgh; of which the following is an abridgment.

1. M. Berthollet having procured the dephlogisticated spirit in as strong and concentrated a state as he could, immersed into it thread and cloth; which by that means were considerably whitened. In a short time the liquor seemed to lose its strength; upon which it was poured off, and more put in its place; and so on until the substance immersed became perfectly white. Thus, however, the process was not only very expensive, but the stuff was considerably injured; sometimes even losing its cohesion altogether, so that there was a necessity for trying some other method.

2. Using a diluted spirit, he succeeded perfectly in rendering the cloths completely white; but by keeping them for some time, or exposing them for a little to the action of an alkaline lye, they became again brown or yellow.

3. On considering the process of bleaching in the common method, he found that the action of the sun and air are subservient to bleaching only as they prepared the colouring particles for being dissolved and separated by alkaline lixivium. To investigate this subject, he examined the nature of the dews, both such as are precipitated from the atmosphere and those which transpire from vegetables. Both of these were found so strongly impregnated with dephlogisticated air, that they destroyed the colour of paper when faintly tinged with turnsole. Hence our author observes, that it is by no means improbable that the ancient prejudices concerning May-dews might have arisen from some observations analagous to this, more especially as in that month the transpiration of plants is extremely copious.

4. By imitating with the dephlogisticated marine acid and alkaline lye the common process of bleaching, he succeeded.

Bleaching succeeded in making a perfect and permanent white. For this purpose an alkaline lixivium was employed alternately with the dephlogisticated marine acid; the latter being no longer used in a concentrated state. Thus he avoided both the inconvenience arising from the suffocating smell of the liquid, and that of its destroying the texture of the stuff immersed in it.

5. The cloth is prepared for bleaching in this manner by steeping it 24 hours in water, to extract the dressing it receives from the weaver: a little old lye, which has already lost the greatest part of its strength in other processes, may be used with advantage. It is next to be exposed once or twice to the action of some good fresh alkaline lye; in order to separate by means of this cheaper liquid all the colouring matter which it can extract, and thereby save the dephlogisticated acid.

6. The stuff must now be carefully washed with water to separate any remains of the lye which might adhere to it and weaken the action of the liquor. It is then to be disposed of in wooden troughs, so that the dephlogisticated acid may pass freely through every part of it; to allow which, it must lie quite loose, without being tightened or straitened in any part. All these troughs ought to be constructed entirely of wood without any iron, as that would easily be corroded and stain the cloth.

7. The first immersion in the dephlogisticated acid is to continue 3 hours; after which the cloth is to be removed, and the liquor wrung out of it. It must then be washed a second time with alkaline lye; which being also washed out, it is to be again immersed in dephlogisticated acid.

8. The second immersion in the acid is to continue only about half an hour; after which it is to be taken out and wrung as before. The same liquor may serve for several immersions; only when it appears to be much exhausted, it is to be restored by an addition of fresh liquor.

9. After the cloth seems to be sufficiently whitened, excepting only some few black threads and the selvages, it is to be filled with black soap, and strongly rubbed for some time; after which it is to be again washed in alkaline lye, and receive another immersion in the acid liquor.

10. It has not yet been determined what number of immersions in the acid are necessary to whiten linen cloth, though our author supposes from six to eight to be sufficient for the purpose.

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Method of
preparing
the dephlo-
gisticated
acid.

11. To prepare the dephlogisticated acid, M. Berthollet recommends six ounces of black manganese finely powdered, 16 ounces of sea-salt likewise in powder, and 12 ounces of concentrated vitriolic acid diluted with eight ounces of water; though the quantity of this last must be variable according to the strength of the acid and the dryness of the salt. If the manganese is impure, its quantity is to be augmented in proportion to the supposed impurity; and it is known whether a sufficient quantity has been employed, by a portion remaining behind and retaining its black colour. When the materials are prepared, the manganese and common salt, both reduced to fine powder, must be mixed accurately together, and put into the distilling vessel placed in a sand-bath; the vitriolic acid diluted with water and allowed to cool is then to be poured upon them, and the junctures exactly luted. The re-

ceiver may be of wood covered in the inside with **Bleaching** wax, and of a very large size; for the gas is absorbed in proportion to the surface of the water it acts upon. Our author describes an apparatus rather complicated, and which our limits will not allow us to describe in this place, especially as the preparation of this liquid is not as yet so generally practised that it can be determined how far one apparatus is preferable to another. The requisites are, that the receiver should not only be capacious but broad, in order that the gas, which is very volatile, may meet with a large surface of water to absorb as much of it as possible. It is very improbable, however, that all the gas can be absorbed by a single receiver, let us make it as large as we will; for which reason it will be proper to have several of them connected with each other by glass tubes, so that what escapes from one may be absorbed by another. Thus we are sure of having the water fully impregnated with the gas; though we cannot by any means concentrate this liquid like the mineral acids. By means of condensing engines, indeed, a greater quantity of it might be forced into the water than it can naturally contain; but this could answer no useful purpose; for the moment that a bottle containing such liquor was opened, the superfluous gas would fly off with violence and danger to the person who opened it. The bottles themselves would also be liable to burst on every slight alteration of temperature in the atmosphere. It is proper therefore not to attempt the preparation of the liquor in any great degree of strength; though this is indeed attended with a very considerable inconvenience, viz. the difficulty of transporting it from the place where it is prepared to the bleachfield, on account of the great bulk and weight of it. M. Berthollet proposes to have it made at the place where the cloth is to be bleached; and so near, that the dephlogisticated spirit of salt might be conveyed by spouts to the troughs which contain the cloth. This, however, must in many cases be impracticable, unless we suppose the generality of bleachers to be possessed of a skill in managing chemical operations which at present they have not. When great quantities of liquor are to be brought from distant places, however, it must undoubtedly be a great discouragement, especially if the best methods have not been used in the preparation so that the liquor could not be afforded at a very low price.

It would add much to the importance of this new ⁵ **Expence of** method if a comparative estimate of the expences of it ^{this me-} and of the old one were fairly laid before the public, ^{thod hi-} and the preference in this respect appeared justly due ^{thereto un-} to the former. This hath not yet been done; nor even ^{determined.} the first and most essential step towards it taken, viz. the determining how much stuff a certain quantity of dephlogisticated spirits of salt will whiten. From such experiments as we have made on the subject, it is probable that the acid drawn from one pound of salt will whiten four of linen cloth without any addition.— This may seem a small expence; but if we consider the vitriolic acid to be made use of, and that the residuum is useless, it would soon be found very considerable. Glauber's salt may indeed be prepared from the residuum of the distillation; but so much of that article is prepared otherwise, that at present the making of it is no object. M. Berthollet mentions the separation of the

Bleaching. the mineral alkali from the residuum; and says he has received some instructions on this head from M. Morveau and others, but conceals them on account of their being communicated as secrets. Under the article **CHEMISTRY**, we have taken notice that some celebrated chemists assert that the calces of lead, or lead itself, will decompose sea-salt, and thus afford an easy method of procuring the mineral-alkali. On this principle indeed attempts have been made to procure it, but hitherto without success; and from such experiments as we have made it seems to be totally impracticable. The method of decomposing Glauber's salt and other vitriolic salts by means of charcoal, described under the article **CHEMISTRY**, n° 716. is the only one that seems to promise success. The difficulty here is, that the salt is converted into an hepar sulphuris, which cannot be decomposed but by means of an acid. A method of applying sorrel for this purpose has lately been tried with great probability of success. The particulars hitherto discovered concerning this method are, 1. Sea-salt yields one half its weight of pure alkali. 2. From 20 to 25 pounds of fresh sorrel leaves are to be used for every pound of sea-salt. 3. The plant is easily cultivated, yields three crops annually if properly managed, and is superior in acidity in its cultivated state to the wild sorrel. The above calculation was made with wild sorrel. 4. An acre of ground will produce as much sorrel as is sufficient for making from a ton to a ton and an half of alkali. It will not thrive except in moist ground. From these particulars it is probable, that by combining the process of making dephlogisticated spirit of salt with that of preparing the mineral alkali, bleaching might be performed at an easier and cheaper rate than has yet been done; though even here there is some doubt, that without an encouragement from government by taking off the duties from salt and sulphur used in the different operations, a project of this kind might miscarry, to the great detriment of the individual who should attempt it. The reason of such difficulty in the new method of bleaching is, that little or none of the alkali commonly used can be saved. The air also and light of the sun, which in the common way is had for nothing, must in the new way be bought at a certain price. The only advantage therefore is, that in the new method, a considerable portion of time is saved. Hence it is impossible to make an exact comparative calculation of the expence of both methods, without estimating how much labour is saved in the new way. If the price of the labour saved exceeds that of the dephlogisticated spirit of salt, there is no doubt that the use of it will be attended with profit, but not otherwise. It is asserted by M. Berthollet, that in the new way of bleaching, the texture of the cloth is less hurt than in the old one: this too must be reckoned an advantage; though by the bleachers, and indeed by the public in general, it will probably be overlooked, unless they are induced by the *cheapness* to prefer the new to the old method.

Remarks
on the use
of lime.

With regard to the various methods of bleaching with lime described in the former part of this treatise, we cannot help remarking, that from such experiments as we have tried on the subject, this substance seems to possess no power whatever of whitening cloth; on the contrary, in all cases where we either tried it out-

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elves or saw it tried by others, it manifestly prevented the effect of the sun and air in a remarkable degree. When alkali is mixed with it, we are not to ascribe the effect to the lime, but to the alkali; for by the attraction of fixed air from the salt the lime is converted into chalk and becomes wholly inert, while the alkali has its activity augmented by being rendered caustic. Lime-water is totally insignificant unless we put the cloth with it into a close vessel; for lime-water when exposed to the atmosphere instantly loses its activity, the lime being converted into mild calcareous earth, and falling in that state to the bottom. The reason of its destroying the cloth is supposed to be its retaining a quantity of moisture among the threads, so that it never allows the cloth to dry thoroughly: to prevent which, it has been recommended to put the limed cloth through a weak solution of salt, which would no doubt answer the purpose of dissolving the calcareous earth; but when we consider that the lime is a substance, if not pernicious, at least totally useless, it ought certainly to be discouraged as much as possible in the practice of bleaching.

BLEAK, in ornithology. See **CYPRINUS**.

BLECHINGLY, a town of Surry in England, which sends two members to parliament, and the bailiff who returns the members is chosen annually at the lord of the manor's court. The town stands on a hill, and has a fine prospect as far as the South Downs in Sussex. W. Long. 0. 15. N. Lat. 51. 20.

BLEEDING, in therapeutics; see **MEDICINE-Index**. As a surgical operation, see **SURGERY-Index**.

BLEEDING at the Nose, called *Epistaxis*. See **MEDICINE-Index**.

BLEEDING is also used for a hæmorrhage or flux of blood from a wound, rupture of a vessel, or other accident. See **HÆMORRHAGY**.

BLEEDING of a Corpse, is a phenomenon said to have frequently happened in the bodies of persons murdered, which, on the touch, or even the approach, of the murderer, began to bleed at the nose, ears, and other parts; so as formerly to be admitted in England, and still allowed in some other parts, as a sort of detection of the criminal and proof of the fact. Numerous instances of these posthumous hæmorrhagies are given by writers. But this kind of evidence ought to be of small weight: for it is to be observed, that this bleeding does not ordinarily happen, even in the presence of the murderer; yet sometimes in that even of the nearest friends, or persons most innocent; and sometimes without the presence of any, either friend or foe. In effect, where is the impossibility that a body, especially if full of blood, upon the approach of external heat, having been considerably stirred or moved, and a putrefaction coming on, some of the blood-vessels should burst, as it is certain they all will in time?

BLEEDING is also used for the drawing out the sap of plants, otherwise called *tapping*. See **TAPPING**.

BLEKING, a territory in the south part of Sweden, having the Baltic Sea on the south, Smaland on the north, and the province of Schonen on the west. Its principal towns are Christianstadt, Elleholm, Ahuys, Roterby, and Christianople, which last is the capital.

BLEMYES, or **BLEMYES**, a fabulous people of Ethiopia, said to have had no heads; their eyes, mouth,

Bleak
||
Blemyes.

[M m 3]

Blench mouth, &c. being situated in their breasts. See A-
CEPHALOUS.

Blenheim.

BLENCH, or BLANCH. See BLANCH.

BLEND, or BLINDE. See BLINDE.

BLEND-Water, called also *morebough*, a distemper incident to black cattle, comes either from the blood, from the yellows, or from the change of ground.—In order to cure it, take bole armoniac, and as much charcoal-dust as will fill an egg-shell, a good quantity of the inner bark of an oak, dried and pounded together to a powder, and give it to the beast in a quart of new milk and a pint of earning.

BLENHEIM, a village of Germany, in the circle of Suabia, situated in E. Long. 10. 30. N. Lat. 48. 40. This village is remarkable for the defeat of the French and Bavarians in 1704, by the English and their confederates under Prince Eugene and the duke of Marlborough. The French army amounted to 60,000 veterans, who had shared in the conquests of their grand monarch; and were now commanded by two generals the most distinguished at that time in France, Marshal Tallard and the Duke of Bavaria. The former had established his reputation by many victories. He was active and penetrating; his ardour often rose to impetuosity; and he was so shortsighted as to be incapable of seeing objects at a very small distance. The duke of Bavaria was equally experienced in the field, and had stronger motives for activity: His country was ravaged before his eyes, and nothing remained of his possessions but the army which he commanded. The allied army, commanded by Eugene and Marlborough, amounted to about 52,000 men, troops who had long been familiar with victory, and who had seen the French, the Turks, and the Russians, fly before them. Both armies, after many marches and counter-marches, approached each other. The French were posted on a hill near the town of Hochstet; their right covered by the Danube and the village of Blenheim; their left by the village of Lutzingen; and their front by a rivulet, the banks of which were steep and the bottom marshy. The right wing of the French was commanded by Marshal Tallard; their left by the Duke of Bavaria, and under him General Marfin, an experienced Frenchman. Their position being advantageous, they were willing to await the enemy rather than offer battle. On the other hand, Marlborough and Eugene were stimulated to engage them at all events, in consequence of an intercepted letter from Villeroy, intimating that he was preparing to cut off all communication between the Rhine and the allied army. The dispositions, therefore, being made for the attack, and the orders communicated to the general officers, the allied forces advanced into the plain, and were ranged in order of battle. The cannonading began about nine in the morning, and continued to about half after twelve. The troops then advanced to the attack; the right under the direction of Prince Eugene, the left headed by Marlborough, and opposed to Marshal Tallard. Marlborough, at the head of the English troops, having passed the rivulet, attacked the cavalry of Tallard with great bravery. This general being then reviewing the disposition of his troops to the left, his cavalry fought for some time without the presence of their commander. Prince Eugene had not yet attacked the forces of the elector; and it was near an hour before he could bring up his troops to the

engagement. Tallard was no sooner informed that his right was attacked by the duke, than he flew to its head, where he found a furious encounter already begun; his cavalry being thrice driven back, and rallying as often. He had posted a large body of forces in the village of Blenheim; and he made an attempt to bring them to the charge. They were attacked by a detachment of Marlborough's troops so vigorously, that instead of assisting the main body they could hardly maintain their ground. All the French cavalry being thus attacked in flank, was totally defeated. The English army now penetrated between the two bodies of the French commanded by the marshal and elector, while the forces in the village of Blenheim were separated by another detachment. In this distressed situation Tallard flew to rally some squadrons; but from his shortsightedness mistaking a detachment of the enemy for his own, he was made prisoner by the Hessian troops, who were in the allied army. Meanwhile, Prince Eugene on his part, after having been thrice repulsed, at last put the enemy into confusion. The rout then became general, and the flight precipitate. The consternation of the French soldiers was such, that they threw themselves into the Danube, without knowing whither they fled. The allies being now masters of the field of battle, surrounded the village of Blenheim, where a body of 13,000 men had been posted in the beginning of the action, and still maintained their ground. These troops seeing themselves cut off from all communication with the rest of the army, and despairing of being able to force their way through the allies, threw down their arms, and surrendered themselves prisoners of war. Thus ended the battle of Blenheim, one of the most complete victories that ever was obtained. Twelve thousand French and Bavarians were slain in the field or drowned in the Danube; 13,000 were made prisoners of war; and there were taken 100 pieces of cannon, 22 mortars, upwards of 100 pair of colours, 200 standards, 17 pair of kettle drums, upwards of 3000 tents, 34 coaches, 300 loaded mules, two bridges of boats, and all the French baggage, with their military chest. Next day, when the Duke of Marlborough visited his prisoner the marshal, the latter assured him that he had overcome the best troops in the world. "I hope, Sir (replied the duke), you will except those troops by whom they were conquered." The allies, in consequence of this victory, became masters of a country 100 leagues in extent.

BLENHEIM-house, a noble and princely house erected in honour of the Duke of Marlborough at Woodstock near Oxford, which with the manor of Woodstock is settled on the Duke and his heirs, in consideration of the eminent services by him performed for the public; and for building of which house the sum of L. 500,000 was granted by parliament, &c.—The tenure by which his Grace holds the manor of Woodstock is the presenting at the castle of Windsor annually on the day in which the battle of Blenheim was fought, a flag embroidered with flowers-de-lis; which flag is shown to all strangers who visit the castle.

BLENNIUS, in ichthyology, a genus of fishes belonging to the order of jugulares; the characters of which are these: The head slants or declines to one side; there are six rays in the membrane of the gills; the body tapers towards the tail; the belly-fins have only

Blenheim,
Blennius.

Blennius

Bless.

only two blunt bones; and the tail-fin is distinct. The species are 13: viz. 1. The *galeria*, with a transverse membranous crest upon the head. It is found in the European seas. 2. The *cristatus*, with a longitudinal bristly crest betwixt the eyes. 3. The *cornutus*, with a simple ray above the eyes, and a single back-fin. The above two are natives of the Indies. 4. The *ocellaris*, with a furrow betwixt the eyes, and a large spot on the back-fin. 5. The *gattorugine*, with small palmated fins about the eye-brows and neck. It is about seven or eight inches long. These two last are found in the European seas. 6. The *superciliosus*, with small fins about the eye-brows, and a curved lateral line. It is a native of India. 7. The *phycis*, with a kind of crested nostrils, a cirrus or beard on the under lip, and a double fin on the back. It has seven rays on the gill-membrane; the anus is surrounded with a black ring; and the tail is roundish. 8. The *pholis*, has a smooth head, a curve line upon the sides, and the upper jaw is larger than the under one. The two last are found in the Mediterranean sea. 9. The *gunellus*, has 10 black spots on the back-fin. It is found in the Atlantic Ocean. 10. The *mustelaris*, has three rays on the fore-part of the back-fin. It is a native of India. 11. The *viviparus* has two tentacula at the mouth. Schonevelde first discovered this species; Sir Robert Sibbald afterwards found it on the Scottish coast. They bring forth two or three hundred young at a time. Their season of parturition is a little after the depth of winter. Before midsummer, they quit the bays and shores; and retire into the deep, where they are commonly taken. They are a very coarse fish, and eaten only by the poor. They are common in the mouth of the river Esk, at Whitby, Yorkshire; where they are taken frequently from off the bridge. They sometimes grow to the length of a foot. Their form is slender, and the backbone is green, as that of a sea-needle. 12. The *lumpenus* has several dusky-coloured areolæ running across its body. The two last are found in the European seas. 13. The *raninus*, with six divisions in the belly-fins, is found in the lakes of Sweden. It is remarkable, that when this fish appears in the lake, all the other fishes retire; and what is worse, it is not fit for eating.

BLENNY. See the above article.

BLESS (Henry), painter of history and landscape, was born at Bovine, near Dinant, in 1480. He acquired his skill in the art merely by the strength of his natural genius, assisted by a diligent study and observation of the works of Patenier, without having any other instructor: and at last rendered himself very eminent, particularly by his landscapes. His best performances were bought up by the Emperor Rodolph, and they are still preserved at Vienna. His style of composition in historical subjects resemble the style of the Flemish artists of that age, and exhibited a great number of figures finished with extreme neatness. But he crowded several subjects into one design; as in his picture of the disciples at Emmaus, he represented not only that incident, but in different groups disposed in the back ground, he represented likewise the different parts of the passion of our Saviour. And yet, notwithstanding the impropriety of that manner of composing, his pictures were so delicately pencilled and finished, and his landscapes in particular so agreeably invented, so full of variety, and well executed, that

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even in Italy his works were in great request, and were distinguished there by the appellation of the *owl-pictures*: for he fixed an owl, as his peculiar mark, in every picture he painted; by which the works of this master are always indisputably known. He died in 1550.

BLESTIUM, a town in Britain. Now *Old-town*, not far from Hereford.

BLETONISM, a faculty of perceiving and indicating subterraneous springs and currents by sensation. The term is modern, and derived from a Mr Bleton, who for some years past has excited universal attention by his possessing the above faculty, which seems to depend upon some peculiar organization. Concerning the reality of this extraordinary faculty, there occurred great doubts among the learned. But M. Thouvenel, a Frenchman of some consequence and a philosopher, seems to have put the matter beyond dispute, in two memoirs which he has published upon the subject. He was charged by the king with a commission to analyse the mineral and medicinal waters in France; and, by repeated trials, he had been so fully convinced of the capacity of Bleton to assist him with efficacy in this important undertaking, that he solicited the ministry to join him in the commission upon advantageous terms. All this shows that the operations of Bleton have a more solid support than the tricks of imposture or the delusions of fancy. In fact, a great number of his discoveries are ascertained by respectable affidavits. The following is a strong instance in favour of Bletonism. "For a long time the traces of several springs and their reservoirs in the lands of the Abbé de Vervains had been entirely lost. It appeared, nevertheless, by ancient deeds and titles, that these springs and reservoirs had existed. A neighbouring abbey was supposed to have turned their waters for its benefit into other channels, and a law-suit was commenced upon this supposition. M. Bleton was applied to: he discovered at once the new course of the waters in question: his discovery was ascertained, and the law-suit was terminated."

Bleton has been mistaken more than once; and our author enumerates, with the fairest candour, the cases in which he has failed: but these cases are very rare in comparison with those in which he has succeeded. Besides, even the mistakes of Bleton do not invalidate the reality of his talent; since a talent may be real without being perfect, or exerting itself with the same success in every trial.

Many were indisposed against Bletonism because they looked upon the facts on which it is founded as inexplicable. But M. Thouvenel assigns principles upon which the impressions made by subterraneous waters and mines may be naturally enough accounted for. Having ascertained a general law by which subterraneous electricity exerts an influence upon the bodies of certain individuals eminently susceptible of that influence, and shown that this law is the same whether the electrical action arises from currents of warm or cold water, from currents of humid air, from coal or metallic mines, from sulphur, and so on, he observes, that there is a diversity in the physical and organical impressions which are produced by this electrical action, according as it proceeds from different fossile bodies which are more or less conductors of electrical emanations.

N n

Blestium,
Bletonism.

Bletonism. tions. There are also artificial processes, which concur in leading us to distinguish the different focuses or conductors of mineral electricity; and in these processes the use of electrometrical rods deserves the attention of philosophers, who might perhaps in process of time substitute in their place a more perfect instrument. Their physical and spontaneous mobility, and its electrical cause, are demonstrated by indisputable experiments.

On the other hand, our author proves, by very plausible arguments, the influence of subterraneous electrical currents, compares them with the electrical currents of the atmosphere, points out the different impressions they produce according to the number and quality of the bodies which act, and the diversity of those which are acted upon. The ordinary sources of cold water make impressions proportional to their volume, the velocity of their currents, and other circumstances. Their stagnation destroys every species of electrical influence; at least, in this state they have none that is perceptible. Their depth is indicated by geometrical processes, founded upon the motion and divergence of the electrical rays; but there are second causes which sometimes diversify these indications, and occasion seeming errors. These errors, however, according to our author, are only exceptions to the general rule; exceptions which depend on the difference of mediums and situations, and not on the inconstancy or incertitude of the organical, sensitive, or convulsive faculties of the Bletonist.

All the hot springs in France, traced by our author from the places where they flow to the places where their formation commences (sometimes at a distance of 15 leagues), led him constantly to masses of coal; where they are collected and heated in basins of different depths and dimensions, nourished by the filtration of lakes and the course of torrents, and mineralized by saline, sulphureous, metallic, and bituminous substances, in the natural furnaces where they are heated, or in the strata through which they flow.

The last and the most singular and important phenomenon which our author met with in the course of his experiments must not be here omitted. Over the veins of iron mines alone the electrometrical rods assume a motion of rotation diametrically opposite to that which they exhibit over all other mines. This phenomenon takes place with the same distinction when iron and other metals are extracted from their mines and deposited under ground. But the most remarkable circumstance in this distinctive action of these metals is, that it has a uniform and constant direction from east to west in all metals, iron excepted, just as iron rendered magnetic has an action directed from south to north. The action of red metals is more palpable than that of the white; but the latter, though weaker, has nevertheless a real existence in the sulphur. In the supplement to this memoir, there is an accurate account of the processes that have furnished these invariable results. They will naturally suggest, says our author, the idea of constructing an electrical compass, which may be of as eminent use in experimental philosophy as the magnetic compass is in navigation. The natural and spontaneous direction of metallic emanations towards the west being ascertained, it only remains to render them palpable by the construction of an instru-

ment which may be substituted in the place of the electrometrical twig that goes vulgarly by the name of the *divining rod*. **Bletonism, Blight.**

His analysis of the hot springs of Bourbon-Lancy, to the source of which in the great mountains of Burgundy he was led by the electrical sensations of Bleton, shows the great intelligence and sagacity of our author in operations of this nature. He found the origin of these famous hot springs in the centre of an oblong rising ground, full of coal, and commanded on three sides by a group of mountains, of which the greatest part was filled with the same mineral. From a particular case, here circumstantially described, in which the electrical rays of the subterraneous water and those of the adjacent coal crossed each other, our author deduces a very natural account of the errors which may sometimes, though rarely, mislead for a time the greatest adepts in Bletonism, when they find themselves in combined spheres of electrical activity. Another observation, which seems confirmed by several facts, accounts farther for this fallibility: the observation is, that electrical rays, whether direct or collateral, issuing from subterraneous focuses, seem to undergo in certain cases a sort of refraction as they pass from one medium to another, or traverse bodies which differ with respect to the property of transmitting this electricity. In a word, it follows from these observations, that when such privileged investigators of currents or minerals as Bleton are placed upon the electrical spheres of these bodies, they will indicate their situation and their respective depths according to the impressions they feel within themselves, or the motions they observe in the electrometrical instruments which they employ: and if they meet with second accidental causes or complications of electrical spheres, which modify or alter these methods of trial, this will necessarily occasion mistakes in the results of their operations which they may probably rectify; but which, at all events, it would be unjust to lay to their charge, or allege as an objection against the reality of their talent.

BLIGHT, in husbandry, a disease incident to plants, which affects them variously, the whole plant sometimes perishing by it, and sometimes only the leaves and blossoms, which will be scorched and shrivelled up, the rest remaining green and flourishing.

Some have supposed that blights are usually produced by an easterly wind, which brings vast quantities of insects eggs along with it, from some distant place, that, being lodged upon the surface of the leaves and flowers of fruit-trees, cause them to shrivel up and perish.

To cure this distemper, they advise the burning of wet litter on the windward side of the plants, that the smoke thereof may be carried to them by the wind, which they suppose will stifle and destroy the insects, and thereby cure the distemper.

Others direct the use of tobacco-dust, or to wash the trees with water wherein tobacco-stalks have been infused for 12 hours; which they say will destroy those insects, and recover the plants.

Pepper-dust scattered over the blossoms of fruit-trees, &c. has been recommended as very useful in this case; and there are some that advise the pulling of the leaves that are distempered.

The true cause of blights seem to be continued dry easterly

Blighted,
Blind.

easterly winds for several days together, without the intervention of showers, or any morning dew, by which the perspiration in the tender blossom is stopped; and if it so happens that there is a long continuance of the same weather, it equally affects the tender leaves, whereby their colour is changed, and they wither and decay.

The best remedy for this distemper, is gently to wash and sprinkle over the tree, &c. from time to time with common water; and if the young shoots seem to be much infected, let them be washed with a woollen cloth, so as to clear them, if possible, from this glutinous matter, that their respiration and perspiration may not be obstructed. This operation ought to be performed early in the day, that the moisture may be exhaled before the cold of the night comes on: nor should it be done when the sun shines very hot.

Another cause of blights in the spring, is sharp hoary frosts, which are often succeeded by hot sunshine in the day-time. This is the most sudden and certain destroyer of the fruits that is known.

BLIGHTED CORN. See SMUT.

¹
Blindness,
what.

BLIND, an epithet applied to a person or sensitive creature deprived of the use of his eyes; or, in other words, to one from whom light, colours, and all the glorious variety of the visible creation, are intercepted by some natural or accidental disease. Such is the literal acceptation of the term: but it is likewise used in a metaphorical sense, to signify mental or intellectual darkness; and frequently implies, at the same time, some moral or spiritual depravity in the soul thus blinded, which is either the efficient or continuing cause of this internal malady. Yet, even in metaphor, the epithet of *blind* is sometimes applied to a kind of ignorance, which neither involves the ideas of real guilt nor of voluntary error. It is, however, our present intention to consider the word, not in its figurative, but in its natural and primary sense. Nor do we mean in this place to regard it as a subject of medical speculation, or to explore its causes and enumerate its cures. These are in the department of another science †. It is rather our design to consider, By what means this inexpressible misfortune may be compensated or alleviated to those who sustain it; what advantages and consolations they may derive from it; of what acquisitions they may be susceptible; what are the proper means of their improvement; or by what culture they may become useful to themselves, and important members of society.

²
Either natural or metaphorical.

† See the Index subjoined to *Medicine*.

³
How the blind may be rendered useful in an individual or a social capacity.

There is not perhaps any sense or faculty of the corporeal frame, which affords so many resources of utility and entertainment as the power of vision; nor is there any loss or privation which can be productive of disadvantages or calamities so multiform, so various, and so bitter, as the want of sight. By no avenue of corporeal perception is knowledge in her full extent, and in all her forms, so accessible to the rational and inquiring soul, as by the glorious and delightful medium of light. For this not only reveals external things in all their beauties, in all their changes, and in all their varieties; but gives body, form, and colour, to intellectual ideas and abstract essences; so that the whole material and intelligent creation lie in open prospect, and the majestic frame of nature in its whole extent, is, if we may speak so, perceived at a single glance. To the

blind, on the contrary, the visible universe is totally annihilated; he is perfectly conscious of no space but that in which he stands, or to which his extremities can reach. Sound, indeed, gives him some ideas of distant objects; but those ideas are extremely obscure and indistinct. They are obscure, because they consist alone of the objects whose oscillations vibrate on his ear, and do not necessarily suppose any other bodies with which the intermediate space may be occupied, except that which gives the sound alone: they are indistinct, because sounds themselves are frequently ambiguous, and do not uniformly and exclusively indicate their real causes. And though by them the idea of distance in general, or even of some particular distances, may be obtained; yet they never fill the mind with those vast and exalting ideas of extension which are inspired by ocular perception. For though a clap of thunder, or an explosion of ordnance, may be distinctly heard after they have traversed an immense region of space; yet, when the distance is uncommonly great, it ceases to be indicated by sound; and therefore the ideas, acquired by auricular experiment, of extension and interval, are extremely confused and inadequate. The living and comprehensive eye darts its instantaneous view over expansive valleys, lofty mountains, protracted rivers, illimitable oceans. It measures, in an indivisible point of time, the mighty space from earth to heaven, or from one star to another. By the assistance of telescopes, its horizon is almost indefinitely extended, its objects prodigiously multiplied, and the sphere of its observation nobly enlarged. By these means, the imagination, inured to vast impressions of distance, can not only recal them in their greatest extent with as much rapidity as they were at first imbibed; but can multiply them, and add one to another, till all particular boundaries and distances be lost in immensity. Thus nature, by profusely irradiating the face of things, and clothing objects in a robe of diversified splendour, not only invites the understanding to expatiate on a theatre so extensive, so diversified, and so attractive; but entertains and inflames the imagination with every possible exhibition of the sublime or beautiful. The man of light and colours beholds the objects of his attention and curiosity from far. Taught by experience, he measures their relative distances; distinguishes their qualities; determines the situations, positions, and attitudes; presages what these tokens may import; selects his favourites; traverses in security the space which divides them from him; stops at the point where they are placed; and either obtains them with ease, or immediately perceives the means by which the obstacles that intercept his passage to them may be surmounted. The blind not only may be, but really are, during a considerable period, apprehensive of danger in every motion towards any place from whence their contracted powers of perception can give them no intelligence. All the various modes of delicate proportion, all the beautiful varieties of light and colours, whether exhibited in the works of nature or art, are to them irretrievably lost. Dependent for every thing, but mere subsistence, on the good offices of others; obnoxious to injury from every point, which they are neither capacitated to perceive nor qualified to resist; they are, during the present state of being, rather to be considered as prisoners at large, than citizens of nature. The sedentary life, to which by

Blind.

⁴
Disadvantages of blindness.

Blind.

privation of sight they are destined, relaxes their frame, and subjects them to all the disagreeable sensations which arise from dejection of spirits. Hence the most feeble exertions create lassitude and uneasiness. Hence the native tone of the nervous system, which alone is compatible with health and pleasure, destroyed by inactivity, exasperates and embitters every disagreeable impression. Natural evils, however, are always supportable; they not only arise from blind and undesigned causes, but are either mild in their attacks, or short in their duration: it is the miseries which are inflicted by conscious and reflecting agents alone, that can deserve the name of evils. These excruciate the soul with ineffable poignancy, as expressive of indifference or malignity in those by whom such bitter portions are cruelly administered. The negligence or wantonness, therefore, with which the blind are too frequently treated, is an enormity which God alone has justice to feel or power to punish.

5
The situation of the blind described by poets.

Those amongst them who have had sensibility to feel, and capacity to express, the effects of their misfortunes, have described them in a manner capable of penetrating the most callous heart. The venerable father of epic poetry, who in the person of Demodocus the Phæacian bard is said to have described his own situation, proceeds thus:

6
Homer.

Τὸν περὶ Μῦσ' ἐπὶ λήσσει, δίδω δ' ἀγαθὸν τε, κακὸν τε
Ὀφθαλμοῦ μιν ἀμείρεται, δίδω δ' ἠδ' ἄνδρα κοιδόν. Odyss. 9

Dear to the muse, who gave his days to flow
With mighty blessings mix'd with mighty woe,
In clouds and darkness quench'd his visual ray,
Yet gave him power to raise the lofty lay. POPE.

Milton, in his address to light, after a sublime description of his arduous and gloomy journey from the regions of primeval darkness to this our visible diurnal sphere, thus continues to apostrophise the celestial beam:

7
Milton.

Taught by the heav'nly muse to venture down
The dark descent, and up to reascend,
Though hard and rare; thee I revisit safe,
And feel thy sov'reign vital lamp: but thou
Revisit'st not these eyes, that roll in vain
To find thy piercing ray, and find no dawn:
So thick a drop serene hath quench'd their orbs,
Or dim suffusion veil'd. Yet not the more
Cease I to wander, where the muses haunt
Clear spring, or shady grove, or sunny hill,
Smit with the love of sacred song: but chief
Thee, Sion, and the flow'ry brooks beneath,
That wash thy hallow'd feet, and warbling flow,
Nightly I visit; nor sometimes forget
Those other two equall'd with me in fate,
So were I equall'd with them in renown,
Blind Thamyras, and blind Mæonides,
And Tiresias and Phineus prophets old:
Then feed on thoughts, that voluntary move
Harmonious numbers; as the wakeful bird
Sings darkling, and in shadiest covert hid
Tunes her nocturnal note. Thus with the year
Seasons return; but not to me returns
Day, or the sweet approach of ev'n or morn,
Or sight of vernal bloom, or summer's rose,
Or flocks, or herds, or human face divine;
But cloud instead, and ever during dark,

Surrounds me, from the cheerful ways of men
Cut off, and for the book of knowledge fair
Presented with a universal blank,
Of nature's works to me expung'd and ras'd,
And wisdom at one entrance quite shut out.

PAR. LOST, Book III.

The same inimitable author, in his tragedy of Sampson Agonistes, and in the person of his hero, deploras the misfortune of blindness with a pathos and energy sufficient to extort the deepest sighs from the most unfeeling hearts:

But chief of all,
O loss of sight, of thee I must complain!
Blind among enemies, O worse than chains,
Dungeon, or beggary, decrepid age.
Light, the prime work of God, to me is extinct,
And all her various objects of delight
Annul'd, which might in part my grief have eas'd,
Inferior to the vilest now become
Of man or worm. The vilest here excel me:
They creep, yet see; I dark in light expos'd
To daily fraud, contempt, abuse, and wrong,
Within doors, or without, still as a fool,
In power of others, never in my own;
Scarce half I seem to live, dead more than half.
O dark, dark, dark, amid the blaze of noon,
Irrecoverably dark, total eclipse
Without all hope of day!
O first created Beam, and thou great Word,
Let there be light, and light was over all;
Why am I thus bereav'd thy prime decree?
The sun to me is dark,
And silent, as the moon
When she deserts the night,
Hid in her vacant interlunar cave.
Since light so necessary is to life,
And almost life itself, if it be true
That light is in the soul,
She all in every part; why was the sight
To such a tender ball as th' eye confin'd?
So obvious, and so easy to be quench'd?
And not, as feeling, throughout all parts diffus'd,
That she might look at will through ev'ry pore?
Then had I not been thus exil'd from light,
As in the land of darkness, yet in light,
To live a life half dead, a living death:
And bury'd; but yet more miserable!
Myself the sepulchre, a moving grave;
Bury'd, yet not exempt
By privilege of death and burial
From worst of other evils, pains and wrongs,
But made hereby obnoxious more
To all the miseries of life.

Osian, the Caledonian bard, who lived before the authenticated history of his nation dates its origin, who in his old age participated the same calamity, has in more than one passage of his works described his situation in a manner so delicate, yet so pathetic, that it pierces the inmost recesses and excites the finest feelings of the heart. Of these passages, take the following:

“ O thou that rollest above, round as the shield of Osian,
my fathers! whence are thy beams, O sun! whence
thy everlasting light? Thou comest forth in thy awful
beauty, and the stars hide themselves in the sky; the
moon,

Blind.

moon, cold and pale, sinks in the western wave. But thou thyself movest alone: who can be a companion of thy course? The oaks of the mountains fall; the mountains themselves decay with years; the ocean shrinks and grows again; the moon herself is lost in heaven: but thou art for ever the same; rejoicing in the brightness of thy course. When the world is dark with tempests; when thunder rolls and lightning glances through the heavens; thou lookest in thy beauty from the clouds, and laughest at the storm. But to Ossian thou lookest in vain: for he beholds thy beams no more; whether thy yellow hair flows on the eastern clouds, or thou tremblest at the gates of the west. But thou art, perhaps, like me, for a season; and thy years will have an end: thou shalt sleep in thy clouds, careless of the voice of the morning.—Exult then, O sun, in the strength of thy youth! age is dark and unlovely; it is like the glimmering light of the moon, when it shines through broken clouds, and the mist is on the hills, the howling blast of the north is on the plain, the traveller shrinks in the midst of his journey.”

9
The dejection attending blindness accounted for.

Thus dependent on every creature, and passive to every accident, can the world, the uncharitable world, be surprised to observe moments when the *blind* are at variance with themselves and every thing else around them? With the same instincts of self-preservation, the same irascible passions which are common to the species, and exasperated by a sense of debility either for retaliation or defence; can the blind be real objects of resentment or contempt, even when they seem peevish or vindictive? This, however, is not always their character. Their behaviour is often highly expressive, not only of resignation, but even of cheerfulness; and though they are often coldly, and even inhumanly, treated by men, yet are they rarely, if ever, forsaken of heaven. The common Parent of nature, whose benignity is permanent as his existence and boundless as his empire, has neither left his afflicted creatures without consolation or resource. Even from their loss, however oppressive and irretrievable, they derive advantages; not indeed adequate to recompense, but sufficient to alleviate, their misery. The attention of the soul, confined to these avenues of perception which she can command, is neither dissipated nor confounded by the immense multiplicity nor the rapid succession of surround-

10
Some advantages peculiar to the blind.

ing objects. Hence her contemplations are more uniformly fixed upon herself, and the revolutions of her own internal frame. Hence her perceptions of such external things as are contiguous and obvious to her observation become more lively and exquisite. Hence even her instruments of corporeal sensation are more assiduously cultivated and improved, so that from them she derives such notices and presages of approaching pleasure or impending danger as entirely escape the attention of those who depend for security on the reports of their eyes. A blind man, when walking swiftly, or running, is kindly and effectually checked by nature from rudely encountering such hard and extended objects as might hurt or bruise him. When he approaches bodies of this kind, he feels the atmosphere more sensibly resist his progress; and in proportion as his motion is accelerated, or his distance from the object diminished, the resistance is increased. He distinguishes the approach of his friend from far by the sound of his steps, by his manner of breathing, and almost by every audible token which he can exhibit. Prepared for the dangers which he may encounter from the surface of the ground upon which he walks, his step is habitually firm and cautious. Hence he not only avoids those falls which might be occasioned by its less formidable inequalities, but from its general bias he collects some ideas how far his safety is immediately concerned; and though these conjectures may be sometimes fallacious, yet they are generally so true, as to preserve him from such accidents as are not incurred by his own temerity. The rapid torrent and the deep cascade not only warn him to keep a proper distance, but inform him in what direction he moves, and are a kind of audible synopses to regulate his course. In places to which he has been accustom'd, he as it were recognises his latitude and longitude from every breath of varied fragrance that tinges the gale, from every ascent or declivity in the road, from every natural or artificial sound that strikes his ear; if these indications be stationary, and confined to particular places. Regulated by these signs, the *blind* have not only been known to perform long journeys themselves, but to conduct others through dangerous paths at the dark and silent hour of midnight, with the utmost security and exactness (A).

Blind.

It

(A) We have read, in authors of good credit, of a very surprising blind guide who used to conduct the merchants through the sands and deserts of Arabia. Vide *Leo Afric.* Descr. Afr. lib. vi. p. 246. and *Casaub.* Treat. of Enthuf. c. ii. p. 45.

An instance not less marvellous, exists at this present time, and in our own country. “John Metcalf, a native of the neighbourhood of Manchester, where he is well known, became blind at a very early age, so as to be entirely unconscious of light and its various effects. This man passed the younger part of his life as a waggoner, and occasionally as a guide in intricate roads during the night or when the tracks were covered with snow. Strange as this may appear to those who can see, the employment he has since undertaken is still more extraordinary: it is one of the last to which we could suppose a blind man would ever turn his attention. His present occupation is that of a projector and surveyor of highways in difficult and mountainous parts. With the assistance only of a long staff, I have several times met this man traversing the roads, ascending precipices, exploring valleys, and investigating their several extents, forms, and situations, so as to answer his designs in the best manner. The plans which he designs, and the estimates he makes, are done in a method peculiar to himself; and which he cannot well convey the meaning of to others. His abilities in this respect are nevertheless so great, that he finds constant employment. Most of the roads over the Peak in Derbyshire have been altered by his directions; particularly those in the vicinity of Buxton: and he is at this time constructing a new one betwixt Wilmslow and Congleton, with a view to open a communication to the great London road, without being obliged to pass over the mountains.” Account by Dr Baw, published in the *Transactions of the Manchester Society*.

Blind.

11
Whether
the blind
are able to
distinguish
colours.

It were endless to recapitulate the various mechanical operations of which they are capable, by their nicety and accuracy of touch. In some the tactile powers are said to have been so highly improved, as to perceive that texture and disposition of coloured surfaces by which some rays of light are reflected and others absorbed, and in this manner to distinguish colours. But the testimonies for this fact still appear to us too vague and general to deserve public credit. We have known a person who lost the use of his sight at an early period of infancy, who in the vivacity or delicacy of his sensations was not perhaps inferior to any one, and who had often heard of others in his own situation capable of distinguishing colours by touch with the utmost exactness and promptitude. Stimulated, therefore, partly by curiosity to acquire a new train of ideas, if that acquisition were possible; but still more by incredulity with respect to the facts related; he tried repeated experiments, by touching the surfaces of different bodies, and examining whether any such diversities could be found in them as might enable him to distinguish colours: but no such diversity could he ever ascertain. Sometimes, indeed, he imagined that objects which had no colour, or, in other words, such as were black, were somewhat different and peculiar in their surfaces; but this experiment did not always nor universally hold. His scepticism therefore still continues to prevail (B). That their acoustic perceptions are distinct and accurate, we may fairly conclude from the rapidity with which they ascertain the acuteness or gravity of different tones, as relative one to another; and from their exact discernment of the various kinds and modifications of sound, and of sonorous objects, if the sounds themselves be in any degree significant of their causes. From this vivacity and accuracy of external sensation, and from the assiduous and vigorous

applications of a comprehensive and attentive mind alone, we are able to account for the rapid and astonishing progress which some of them have made, not only in those departments of literature which were most obvious to their senses and accessible to their understandings, but even in the abstractest, and (if we may be allowed the expression) in the most occult sciences. What, for instance, can be more remote from the conceptions of a blind man than the abstract relations and properties of space and quantity? yet the incomprehensible attainments of Dr Saunderson in all the branches of mathematics are now fully known and firmly believed by the whole literary world, both from the testimony of his pupils and the publication of his works. But should the fact be still uncertain, it might be sufficiently verified by a living prodigy of this kind with which our country is at present honoured. The gentleman of whom we now speak, though blind from his infancy, by the ardour and assiduity of his application, and by the force of a genius to which nothing is impenetrable, has not only made incredible advances in mechanical operations, in music, and in the languages; but is likewise profoundly skilled in geometry, in optics, in algebra, in astronomy, in chemistry, and in all the other branches of natural philosophy as taught by Newton and received by an admiring world. We are sorry that neither the modesty of this amiable philosopher, nor the limits of this article, will permit us to delineate his character in its full proportions. All we can do is to exhibit his example, that by it the vulgar prejudice, which presumes to think blindness and learning incompatible, may be dissipated; and that an instance of success so noble and recent may inflame the emulation and encourage the efforts of such as have genius and opportunity to pursue the same laudable path (C). If these glorious attempts should neither be

Blind.

12
Instances
how far
they are
susceptible
of abstract
learning.

(B) See, however, the extraordinary case subjoined to this article.

(C) As particular anecdotes of this astonishing genius have been, since the former edition of the *Encyclopædia*, delivered to the Manchester Society by G. Bew, M. D. and afterwards published, we shall here take the liberty to transcribe them from the original volume in which they are inserted, as this freedom is authorized by a letter from Dr Bew's own hand.

"Dr Henry Moyes, who occasionally read Lectures on Philosophical Chemistry at Manchester, like Dr Saunderson, the celebrated professor of Cambridge, lost his sight by the small-pox in his early infancy. He never recollected to have seen: 'but the first traces of memory I have (says he), are in some confused ideas of the solar system.' He had the good fortune to be born in a country where learning of every kind is highly cultivated, and to be brought up in a family devoted to learning.

"Possessed of native genius, and ardent in his application, he made rapid advances in various departments of erudition; and not only acquired the fundamental principles of mechanics, music, and the languages, but likewise entered deeply into the investigation of the profounder sciences, and displayed an acute and general knowledge of geometry, optics, algebra, astronomy, chemistry, and in short of most of the branches of the Newtonian philosophy.

"Mechanical exercises were the favourite employments of his infant years. At a very early age he made himself acquainted with the use of edged tools so perfectly, that notwithstanding his entire blindness, he was able to make little wind-mills; and he even constructed a loom with his own hands, which still show the cicatrices of wounds he received in the execution of these juvenile exploits.

"By a most agreeable intimacy and frequent intercourse which I enjoyed with this accomplished blind gentleman, whilst he resided in Manchester, I had an opportunity of repeatedly observing the peculiar manner in which he arranged his ideas and acquired his information. Whenever he was introduced into company, I remarked that he continued some time silent. The sound directed him to judge of the dimensions of the room, and the different voices of the number of persons that were present. His distinction in these respects was very accurate; and his memory so retentive, that he seldom was mistaken. I have known him instantly recognize a person, on first hearing him speak, though more than two years had elapsed since the time of their last meeting.

He

Blind.

perceived nor rewarded by an unfeeling world, if human nature should forget to recognize its own excellence so nobly displayed in instances of this kind; yet besides the enjoyments resulting from a sublime and comprehensive understanding, besides the immortal and inexhaustible sources of delight, which are the peculiar portion of a self-approving mind, these happy pupils and favourites of Nature are as it were indulged with her personal intercourse. They become more intimately acquainted with her laws, till by exploring the beneficence of her œconomy, the sublimity of her ends, the regularity of her procedure, and the beauties of her frame, they imbibe the spirit, and feel the presence, of her glorious Author:

By swift degrees the love of nature works,
And warms the bosom; till at last, sublim'd
To rapture and enthusiastic heat,
We feel the present deity, and taste
The joys of God to see a happy world.

THOMSON.

13
Accounts of
the effects of
recovered
sight upon
those who
have been
born blind
uncertain.

Much labour has been bestowed to investigate, both from reason *à priori* and from experiment, what might be the primary effects of light and luminous objects upon such as have been born blind, or early deprived of sight, if at a maturer period they should instantaneously recover their visual powers. But upon this topic there is much reason to fear, that nothing satisfactory has yet been said. The fallacy of hypothesis and conjecture, when formed *à priori* with respect to any organ of corporeal sensation and its proper object, is too obvious to demand illustration. But from the nature of the eye, and the mediums of its perception, to attempt an investigation of the various and multiform phenomena of vision, or even of the varieties of which every particular phenomenon is susceptible according as

the circumstances of its appearance are diversified, would be a project worthy of philosophy in a delirium. Nay, even the discoveries which are said to accrue from experiment, may still be held as extremely doubtful and suspicious; because in these experiments it does not appear to have been ascertained, that the organs to which visible objects were presented immediately after surgical operations, could be in a proper state to perceive them. Yet after all, it is extremely probable, that figure, distance, and magnitude, are not immediate objects of ocular sensation, but acquired and adjusted by long and reiterated experience (D). There are, however, many desiderata, which the perceptions of a man born blind might considerably illustrate, if his instruments of vision were in a right state, and assisted by a proper medium. Such a person might perhaps give a clearer account, why objects, whose pictures are inverted upon the retina of the eye, should appear to the mind in their real positions; or why, though each particular object is painted upon the retina of both our eyes, it should only be perceived as single. Perhaps, too, this new spectator of visible nature might equally amuse our curiosity and improve our theory, by attempting to describe his earliest sensations of colour, and its original effects upon his organ and his fancy. But, as we have already hinted, it is far from being certain, that trials of this kind have ever been fairly made. Such readers as may wish to see a more minute detail of these questions, may consult M. Diderot's *Lettre sur les aveugles, à l'usage de ceux qui voyent*: "A letter concerning the blind for the use of those who see." To these may be added, Mr Cheselden's *Anatomy*, and Locke's *Essay on the human understanding*.

Blind.

When we ruminate on the numberless advantages derived from the use of sight, and its immense importance,

Diderot's
Works,
Vol. II.

He determined pretty nearly the stature of those he was speaking with by the direction of their voices; and he made tolerable conjectures respecting their tempers and dispositions, by the manner in which they conducted their conversation.

"It must be observed, that this gentleman's eyes were not totally insensible to intense light. The rays refracted through a prism, when sufficiently vivid, produced certain distinguishable effects on them. The red gave him a disagreeable sensation, which he compared to the touch of a saw. As the colours declined in violence, the harshness lessened, until the green afforded a sensation that was highly pleasing to him, and which he described as conveying an idea similar to what he felt in running his hand over smooth polished surfaces. Polished surfaces, meandering streams, and gentle declivities, were the figures by which he expressed his ideas of beauty: Rugged rocks, irregular points, and boisterous elements, furnished him with expressions for terror and disgust. He excelled in the charms of conversation; was happy in his allusions to visual objects; and discoursed on the nature, composition, and beauty of colours, with pertinence and precision.

"Doctor Moyes was a striking instance of the power the human soul possesses of finding resources of satisfaction, even under the most rigorous calamities. Though involved 'in ever during darkness,' and excluded from the charming views of silent or animated nature; though dependent on an undertaking for the means of his subsistence, the success of which was very precarious; in short, though destitute of other support than his genius, and under the mercenary protection of a person whose integrity he suspected, still Dr Moyes was generally cheerful, and apparently happy. Indeed it must afford much pleasure to the feeling heart to observe this hilarity of temper prevail almost universally with the blind. Though 'cut off from the ways of men, and the contemplation of the human face divine,' they have this consolation; they are exempt from the discernment and contagious influence of those painful emotions of the soul that are visible on the countenance, and which hypocrisy itself can scarcely conceal. This disposition likewise may be considered as an internal evidence of the native worth of the human mind, that thus supports its dignity and cheerfulness under one of the severest misfortunes that can possibly befall us."

(D) The gentleman couched by Mr Cheselden had no idea of distance; but thought that all the objects he saw, touched his eyes, as what he felt did his skin. It was also a considerable time before he could remember which was the cat and which the dog, though often informed, without first feeling them.

Blind.

ance, in extending the human capacity, or in improving and cultivating every faculty and every function of the mind, we might be strongly tempted to doubt the fidelity of those reports which we have heard concerning such persons as, without the assistance of light, have arrived at high degrees of eminence even in those sciences which appear absolutely unattainable but by the interposition of external mediums. It has, however, been demonstrated by a late ingenious author, that *blind* men, by proper instruction, are susceptible almost of every idea, and of every truth which can be impressed on the mind by the mediation of light and colours, except the sensations of light and colours themselves †.

† See Dr Reid's Inquiry into the Human Mind, chap. vi. § 1, 2.

14 How the blind catch the enthusiasm inspired by visual perceptions, a paradox.

Yet there is one phenomenon of this kind which seems to have escaped the attention of that great philosopher, and for which no author either of this or any former period has been able to offer any tolerable account. Still, however, it seems to merit the attention of a philosopher. For though we should admit, that the blind can understand with great perspicacity all the phenomena of light and colours; though it were allowed, that in these subjects they might extend their speculations beyond their instructions, and investigate the mechanical principles of optics by the mere force of genius and application, from the data which they had already obtained; yet it will be difficult, if not impossible, to assign any reason why these objects should be more interesting to a blind man than any other abstract truths whatever. It is possible for the blind, by a retentive memory, to tell you, That the sky is an azure; that the sun, moon, and stars, are bright; that the rose is red, the lily white or yellow, and the tulip variegated. By continually hearing these substantives and adjectives joined, he may be mechanically taught to join them in the same manner: but as he never had any sensation of colour, however accurately he may speak of coloured objects, his language must be like that of a parrot; without meaning, or without ideas. Homer, Milton, and Ossian, had been long acquainted with the visible world before they were surrounded with clouds and ever-during darkness. They might, therefore, still retain the warm and pleasing impressions of what they had seen. Their descriptions might be animated with all the rapture and enthusiasm which originally fired their bosoms when the grand or delightful objects which they delineated were immediately beheld. Nay, that enthusiasm might still be heightened by a bitter sense of their loss, and by that regret which a situation so dismal might naturally inspire. But how shall we account for the same energy, the same transport of description, exhibited by those on whose minds visible objects were either never impressed, or have been entirely obliterated? Yet, however unaccountable this fact may appear, it is no less certain than extraordinary. But delicacy and other particular circumstances forbid us to enter into this disquisition with that minuteness and precision which it requires. We only mention the fact as one amongst the few resources for entertainment, and avenues to reputation, which are still reserved for the *blind*. Whoever thinks the subject of sufficient consequence to merit a nicer scrutiny, may consult the

Preface to Blacklock's Poems, written by G. G. Esq; and printed at Edinburgh 1754; or the account of his life and writings by the Rev. Mr Spence, prefixed to a quarto edition of his poems published at London in 1756.

It is hoped, however, that we shall not be suspected of partiality for inserting a character of the same author by one who was a foreigner, a stranger to his person, and prepossessed in his favour by his works alone.

"Blacklock will appear to posterity a fabulous character: even now he is a prodigy. It will be thought a fiction and a paradox, that a man quite blind since he was three years old (†), besides having made himself so good a master of various languages, of Greek, Latin, Italian, and French, should also be a great poet in his own; and without hardly ever having seen the light, should be so remarkably happy in description *."

It is impossible to enter into a detail of particulars with respect to the education of the blind. These must be left to be determined by the genius, the capacity, the circumstances, of those to whom the general rules which may be given should be applied. Much therefore must depend on their fortunes, much on their temper and genius; for unless these particulars were known, every answer which could be given to questions of this kind must be extremely general, and of consequence extremely superficial. Besides, the task is so much more arduous, because whoever attempts it can expect to derive no assistance from those who have written on education before him: And though the blind have excelled in more than one science; yet, except in the case of Saunderson, professor of mathematics in the university of Cambridge, concerning whom we shall afterwards have occasion to speak, it does not appear, that any of them have been conducted to that degree of eminence, at which they arrived, upon a premeditated plan. One should rather imagine, that they have been led through the general course and ordinary forms of discipline; and that, if any circumstances were favourable to their genius, they rather proceeded from accident than design.

This fact, if not supported by irrefragable evidence, should, for the honour of human nature, have been suppressed. When contemplated by a man of benevolence and understanding, it is not easy to guess whether his mortification or astonishment would be most sensibly felt. If a heart that glows with real philanthropy must feel for the whole vital creation, and become, in some measure, the *sensorium* of every suffering insect or reptile; how must our sympathy increase in tenderness and force, when the distressed individuals of our own species become its objects? Nor do the blind bear so small a proportion to the whole community, as, even in a political view, to be neglected. But in this, as in every other political crime, the punishment returns upon the society in which it is committed. Those abandoned and unimproved beings, who, under the influence of proper culture and discipline, might have successfully concurred in producing and augmenting the general welfare, become the nuisances and burdens of those very societies who have neglected them.

There

Blind.

* Carlo Denina, *Discorso della Letteratura*, chap. xi.

15 Of the education of the blind.

(†) The author is here mistaken: Dr Blacklock only saw the light for five months.

Blind.

16
Why the
blind de-
serve, and
how they
may repay
public sym-
pathy.

There is perhaps no rank of beings in the sensible universe, who have suffered from nature or accident, more meritorious of public compassion, or better qualified to repay its generous exertions, than the blind. They are meritorious of compassion; for their sphere of action and observation is infinitely more limited than that of the deaf, the lame, or of those who labour under any other corporeal infirmity consistent with health. They are better qualified to repay any friendly interposition for their happiness; because, free from the distraction which attends that multiplicity of objects and pursuits that are continually obvious to the sight, they are more attentive to their own internal economy, to the particular notices of good and evil impressed on their hearts, and to that peculiar province in which they are circumscribed by the nature and cultivation of their powers.

17
Proper em-
ployments
for the
blind.

It will easily occur to the reader, that, if the pupil should not be placed in easy circumstances, music is his readiest and most probable resource. Civil and ecclesiastical employments have either something in their own nature, or in the invincible prejudices of mankind, which renders them almost entirely inaccessible to those who have lost the use of sight. No liberal and cultivated mind can entertain the least hesitation in concluding, that there is nothing, either in the nature of things, or even in the positive institutions of genuine religion, repugnant to the idea of a blind clergyman. But the novelty of the phenomenon, while it astonishes vulgar and contracted understandings, inflames their zeal to rage and madness. Besides, the adventitious trappings and ceremonies assumed by some churches as the drapery of religion, would, according to these systems, render the sacerdotal office painful, if not impracticable, to the blind.

Dr Nicho-
las Bacon.

We have, some years ago, read of a blind gentleman*, descended from the same family with the celebrated lord Verulam, who, in the city of Brussels, was with high approbation created doctor of laws; since that period we have been honoured with his correspondence. He was deprived of sight at nine years of age by an arrow from a cross-bow whilst he was attempting to shoot it. When he had recovered his health, which had suffered by the shock, he pursued the same plan of education in which he had been engaged; and having heard that one Nicasius de Vourde, born blind, who lived towards the end of the 15th century, after having distinguished himself by his studies in the university of Lovain, took his degree as doctor of divinity in the university of Cologne; this motive prevailed with him to make the same attempt. But the public, cursed with prejudices for which the meanest sensitive nature might blush, prejudices equally beneath the brutality and ignorance of the lowest animal instinct, treated his intention with ridicule: even the professors were not far from being of that sentiment; and they admitted him into their schools, rather from an impression that it might amuse him, than become of any use to him. He had the good fortune, however, contrary to their expectations, to obtain the first places among his condisciples. It was then said, that such rapid advances might be made in the preliminary branches of his education; but would soon be effectually checked by studies of a more profound and abstracted nature. This, it seems, was repeated from school to school, through the whole climax

VOL. III. Part I.

of his pursuits; and when, in the course of academical learning, it became necessary to study poetry, it was the general voice that all was over, and that at length he had reached his *ne plus ultra*. But here he likewise confronted their prepossessions, and taught them the immense difference between blindness of body and blindness of soul. After continuing his studies in learning and philosophy for two years more, he applied himself to law, took his degree in that science, commenced pleading counsellor or advocate in the council of Barbant, and has had the pleasure of terminating almost every suit in which he has been engaged to the satisfaction of his clients.

Had it not been for a fact so striking and so well authenticated, though there could have been no doubt that a blind man might discharge the office of a chamber-counsellor with success; yet, as a barrister, his difficulties must have appeared more formidable, if not absolutely insuperable. For he should remember all the sources, whether in natural equity or positive institutions, whether in common or statutory law, from whence his argument ought to be drawn. He must be able to specify, and to arrange in their proper order, all the material objections of his antagonists: these he must likewise answer as they were proposed, *extempore*.

When, therefore, it is considered how difficult it is to temper the natural association of memory with the artificial arrangements of judgment, the desultory flights of imagination with the calm and regular deductions of reason, the energy and perturbation of passion with the coolness and tranquillity of deliberation; some idea may be formed of the arduous task which every blind man must achieve, who undertakes to pursue the law as a profession. Perhaps assistances might be drawn from Cicero's treatise on Topics and on Invention; which if happily applied and improved, might lessen the disparity of a blind man to others, but could scarcely place him on an equal footing with his brethren. And it ought to be fixed as an inviolable maxim, that no blind man ought ever to engage in any province in which it is not in his power to excel. This may at first sight appear paradoxical; but it is easily explained. For the consciousness of the obvious advantages possessed by others, habitually predisposes a blind man to despondency: and if he ever gives way to despair (which he will be too apt to do when pursuing any acquisition when others have a better chance of success than himself), adieu, for ever adieu, to all proficiency. His soul sinks into irretrievable depression; his abortive attempts incessantly prey upon his spirit; and he not only loses that vigour and elasticity of mind which are necessary to carry him through life, but that patience and serenity which alone can qualify him to enjoy it.

In this recapitulation of the learned professions, we have intentionally omitted physic; because the obstacles which a blind man must encounter, whether in the theory or practice of that art, will be more easily conceived by our readers than described in detail. From this, therefore, let us pass to more general subjects,

It has been formerly hinted, that the blind were objects of compassion, because their spheres of action and observation were limited: and this is certainly true.

O o

For

Blind.

18
Law diffi-
cult, tho'
not impos-
sible, for
the blind.

19
The blind
naturally
subject to
desponden-
cy, should
be stimula-
ted by the
prospect of
attainable
excellence.

20
Physic per-
haps im-
practical to
the blind.

Blind.

For what is human existence, in its present state, if you deprive it of action and contemplation? Nothing then remains but the distinction which we derive from form or from sensitive and locomotive powers. But for these, unless directed to happier ends by superior faculties, few rational beings would, in our opinion, be grateful. The most important view, therefore, which we can entertain in the education of a person deprived of sight, is to redress as effectually as possible the natural disadvantages with which he is encumbered; or, in other words, to enlarge as far as possible the sphere of his knowledge and activity. This can only be done by the improvement of his intellectual, imaginative, or mechanical, powers; and which of these ought to be most assiduously cultivated, the genius of every individual alone can determine. Were men to judge of things by their intrinsic natures, less would be expected from the blind than others. But, by some pernicious and unaccountable prejudice, people generally hope to find them either possessed of preternatural talents, or more attentive to those which they have than others: For it was not Rochester's opinion alone,

That if one sense should be suppress'd,
It but retires into the rest.

Hence it unluckily happens, that blind men, who in common life are too often regarded as rare-shows, when they do not gratify the extravagant expectations of their spectators, too frequently sink in the general opinion, and appear much less considerable and meritorious than they really are. This general diffidence of their powers at once deprives them both of opportunity and spirit to exert themselves; and they descend, at last, to that degree of insignificance in which the public estimate has fixed them. From the original dawning, therefore, of reason and spirit, the parents and tutors of the blind ought to inculcate this maxim, That it is their indispensable duty to excel, and that it is absolutely in their power to attain a high degree of eminence. To impress this notion on their minds, the first objects presented to their observation, and the first methods of improvement applied to their understanding, ought, with no great difficulty, to be comprehensible by those internal powers and external senses which they possess. Not that improvement should be rendered quite easy to them, if such a plan were possible: For all difficulties, which are not really or apparently insuperable, heighten the charms and enhance the value of those acquisitions which they seem to retard. But care should be taken that these difficulties be not magnified or exaggerated by imagination; for it has before been mentioned, that the blind have a painful sense of their own incapacity, and consequently a strong propensity to despair continually awake in their minds.

For this reason, parents and relations ought never to be too ready in offering their assistance to the blind in any office which they can perform, or in any acquisition which they can procure for themselves, whether they are prompted by amusement or necessity. Let a blind boy be permitted to walk through the neighbourhood without a guide, not only though he should run some hazard, but even though he should suffer some pain.

If he has a mechanical turn, let him not be denied the use of edge-tools; for it is better that he should

lose a little blood, or even break a bone, than be perpetually confined to the same place, debilitated in his frame, and depressed in his mind. Such a being can have no employment but to feel his own weakness, and become his own tormentor; or to transfer to others all the malignity and peevishness arising from the natural, adventitious, or imaginary evils which he feels. Scars, fractures, and dislocations in his body, are trivial misfortunes compared with imbecility, timidity, or fretfulness of mind. Besides the sensible and dreadful effects which inactivity must have in relaxing the nerves and consequently in depressing the spirits, nothing can be more productive of jealousy, envy, peevishness, and every passion that corrodes the soul to agony, than a painful impression of dependence on others, and of our insufficiency for our own happiness. This impression, which, even in his most improved state, will be too deeply felt by every blind man, is redoubled by that utter incapacity of action which must result from the officious humanity of those who would anticipate or supply all his wants, who would prevent all his motions, who would do or procure every thing for him without his own interposition. It is the course of nature, that blind people, as well as others, should survive their parents; or, it may happen, that they should likewise survive those who, by the ties of blood and nature, are more immediately interested in their happiness than the rest of mankind. When, therefore, they fall into the hands of the world in general, such exigencies as they themselves cannot redress will be but coldly and languidly supplied by others. Their expectations will be high and frequent, their disappointments many and sensible; their petitions will often be refused, seldom fully gratified; and, even when granted, the concession will be so ungraceful, as to render its want infinitely more tolerable than its fruition. For all these reasons, we repeat it once more (because it can never be too frequently reiterated), that, in the formation of a blind man, it is infinitely better to direct than supersede his own exertions. From the time that he can move and feel, let him be taught to supply his own exigencies; to dress and feed himself; to run from place to place, either for exercise, or in pursuit of his own toys or necessities.

In these excursions, however, it will be highly proper for his parent or tutor to superintend his motions at a distance, without seeming to watch over him. A vigilance too apparent, may impress him with a notion that malignity or some other selfish motive may have produced it. When dangers are obvious and great, such as we incur by rivers, precipices, &c. those who are intrusted with the blind will find it neither necessary nor expedient to make their vigilance a secret. They ought then to acquaint their pupil, that they are present with him; and to interpose for his preservation, whenever his temerity renders it necessary. But objects of a nature less noxious, which may give him some pain without any permanent injury or mutilation, may with design be thrown in his way; providing, however, that this design be always industriously concealed. For his own experience of their bad effects will be an infinitely more eloquent and sensible monitor, than the abstract and frigid counsels of any adviser whatever.

When the volatile season of puerile amusement is expired:

Blind.

21
Too much
often ex-
pected from
the blind.

22
The ele-
ments of
education
for the
blind should
neither be
too difficult
nor too ea-
sy.

23
The powers
of action
possessed by
the blind
should ne-
ver be su-
perseded.

Blind.
24
Exercises
suitable to
the blind.

25
Riding on
horseback.

26
Walking in
all weathers
that are to-
lerable.

27
Dumb-bells

28
Bath-chair.

expired, and the impetuous hurry of animal-spirits subsides, through the whole demeanour of his pupil the tutor will probably observe a more sensible degree of timidity and precaution, and his activity will then require to be stimulated more than restrained. In this crisis, exercise will be found requisite, rather to preserve health, and facilitate the vital functions, than merely for recreation. Of all the different kinds of exercise, riding, not in a machine, but on horseback, is by far the most eligible, and most productive of its end. On these occasions, however, care must be taken that the horses employed may neither be capricious nor unmanageable; for on the mansuetude of the creature which he rides, not only his safety, but his confidence, will entirely depend. In these expeditions, whether long or short, his companion or attendant ought constantly to be with him; and the horse should always either be taught implicitly to follow its guide, or be conducted by a leading rein besides the bridle which he himself holds. Next to this mode of exercise, is

walking. If the constitution of the blind boy be tolerably robust, let him be taught to endure every vicissitude of weather which the human species can bear with impunity. For if he has been bred with too much delicacy, particular accidents may supersede all his former scruples, and subject him to the necessity of suffering what will not only be severe in its immediate sensation, but dangerous in its future consequences. Yet, when the cold is so intense, or the elements so tempestuous, as to render air and exercise abroad impracticable, there are methods of domestic exercise, which, though not equally salutary, may still be eligible; such as dumb-bells, or the bath-chair. The first of these are made of lead, consisting of a cylinder, the middle of which may either be rectilinear or arcuated for the convenience of holding, and terminates at each end in a semiglobular mass. Their weight should be conformed to the strength and age of the person who uses them. The method of employing them is to take one in each hand, and swing them backwards and forwards over his head, describing a figure somewhat like a parabola. This not only strengthens the arms, and opens the chest, but promotes the circulation of the fluids. The bath-chair is a deal of 12 feet in length, as free from knots and as elastic as possible, supported by a fulcrum at each end, upon which may be placed two rolling cylinders to give it greater play; when seated upon this, by alternately depressing it with his own weight, and suffering it to return to its natural situation, he gives himself a motion, though not equal in its energy, yet somewhat resembling the trot of a horse. There are other elastic seats of the same kind constructed with steel springs, but one of this simple fabrication may answer the purpose.

The spring deal here recommended by the author, was preferred, as being suitable to the blind in all spheres or conditions of life; but he has since been taught by experience, in a valetudinary state, that the elastic chair is of infinitely greater utility. It consists of three false bottoms, and one real, which is the basis of the whole. The lowest is by far the most extensive. The highest is stuffed to render it an easy seat, and covered with plush, baize, or duffle. Between each of the false bottoms, at either end, behind and before, are placed steel springs, fixed above and below to the

boards; not with nails, but staples, and curved in a spiral or serpentine form, each consisting of seven spires or volumina. The volumina are formed in such a manner, that one of them can pass through another, and thus give the springs full play in rising or descending. The lowest bottom or basis of the whole is protended about four inches; which assists you to mount the seat with more facility, and serves as a support for your feet when you ride. This operation is performed by alternately depressing or raising yourself upon the seat, so that the springs yielding to your weight as you descend, and resisting as you rise, may give you a motion like that of the deal above described, but more violent, more rapid, and consequently more salutary. The whole frame of the seat is surrounded with leather, having different apertures to admit or eject the air occasioned by the motion. These general hints are sufficient to give any ingenious artisan an idea of the nature and structure of the machine, which he may alter or improve as convenience shall dictate.

To these modes of domestic exercise may be added that of a swing, which is formed by a rope suspended from two screws, which ought to be strongly fixed, at proper distances, in the joints of a capacious chamber, with a board and a cushion for a seat, and cords fastened behind and before, lest the impetuosity of the motion should shake the patient out of his position. But this instrument of health is so often formed by children for their amusement, and depends so much upon the form and extent of the area where it vibrates, that a more minute detail of its nature and office would here be unnecessary.

His meals should be temperate, his diet light and Diet. of easy digestion. If the tone of his stomach be vigorous, vegetables should be preferred to animal-food, particularly those vegetables which are most farinaceous and least acrescent. Fermented liquors and ardent spirits should never be given him but to gratify the real demands of exhausted nature: for though they exhilarate the spirits, they at the same time corrode the vessels and relax the nerves; a misfortune doubly pernicious to sedentary life. The safest and most wholesome beverages are milk and water. If he should be tired with these, he may be indulged with the variety of chocolate, balm, sage, or ground-ivy. Coffee may sometimes be taken with impunity: but tea should be interdicted with inflexible severity; for no vegetable juice under heaven is more noxious to sedentary people. Let him also, for similar reasons, be prohibited the use of tobacco in all its forms. In the observations of diet and exercise, let him neither be mechanically regular, nor entirely eccentric. In the one case, he will be a slave to habit, which may create some inconvenience; in the other, he will form no habits at all, which may still be productive of greater.

We have more than once hinted, during the course of this article, that the blind, as liable to all the inconveniences of sedentary life, are peculiarly subjected to that disorder which may be called *tadium vite* or low spirits. This indisposition may be said to comprehend in it all the other diseases and evils of human life; because, by its immediate influence on the mind, it aggravates the weight and bitterness of every calamity to which we are obnoxious. In a private letter,

Blind.

we have heard it described as a formidable precipice, in the regions of misery, between the awful gulfs of suicide on the one hand and phrenzy on the other; into either of which, a gentle breeze, according to the force of its impulse and the line of its direction, may irrecoverably plunge the unhappy victim; yet from both of which he may providentially escape. Though the shades of the metaphor may, perhaps, be unnaturally deepened, yet those who have felt the force of the malady will not fail to represent it by the most dreadful images which its own feelings can suggest. Parents and tutors therefore, if they have the least pretence to conscience or humanity, cannot be too careful in observing and obviating the first symptoms of this impending plague. If the limbs of your blind child or pupil be tremulous; if he is apt to start, and easily susceptible of surprise; if he finds it difficult to sleep; if his slumbers, when commenced, are frequently interrupted, and attended with perturbation; if his ordinary exercises appear to him more terrible and more insuperable than usual; if his appetites become languid and his digestion slow; if agreeable occurrences give him less pleasure, and adverse events more pain than they ought to inspire:—this is the crisis of vigorous interposition. The regimen and exercise above prescribed are the best preventatives of this evil, and perhaps its best remedies when unhappily incurred. But if the symptoms should escape your attention till the patient is actually seized with the distemper, you may then, according to its depth and permanency, apply the cold bath, vitriolic acid, and Peruvian bark. Magnesia alba will, from time to time, be found useful to lenify the severe and corrosive acid generated in the stomach; it is preferable to chalk, to crab's eyes, or any of the other absorbents, because of its laxative tendency. The tincture or infusion of wild valerian, pills of asafœtida, and white mustard-seed, are likewise prescribed. Care should be taken that the patient may never be suffered to remain coſſive, otherwise the function of digestion will be impeded. Gentle cathartics should therefore be administered; but with caution, that their operation may clear the bowels without weakening nature. Emetics may sometimes give the patient a temporary relief, by exerting and bracing the fibres of the stomach; but if used too frequently, they will have a contrary effect: previous to the use of bark, however, they should always be taken to prepare the vessel for its reception. The symptoms above enumerated would seem to indicate the origin of the distemper from extreme weakness or relaxation of nerves: that relaxation may be caused by severe and intemperate thought; by supine indolence; by excessive or habitual drinking; and above all, by venereal gratifications prematurely and frequently indulged, by which the approaches of this evil are accelerated, its continuance insured, and its poignancy augmented. Parents and tutors, therefore, as they value the welfare of their charge, and would answer to God for their conduct, should be scrupulously careful to observe when any of these illegitimate propensities inflame the youthful mind, to check, or rather elude them; not so much by severe reprehension and solemn interdict, as by endeavouring to preoccupy the soul, and engage the intention with other favourite amusements. Against every act of arbitrary power, the

mind strongly and naturally revolts. She should therefore be rather allured to wisdom and virtue, by rational motives and gentle methods, than by cruel menaces and stern commands. Those who are afflicted with low spirits may be said to be doubly unfortunate; for they have not only their own internal sufferings to sustain, but the contempt and ridicule of a thoughtless and unfeeling world, by whom their complaints are thought to be imaginary, and their depression affected. Should the sarcastic or sceptical reader apologize for his want of humanity, by asking in what these internal sufferings consist, it will be easy to give him a clear and solid answer: They arise from a severe and acute feeling of nature's incapacity to discharge the vital functions with tolerable ease; from the sharp and constant irritation inflicted on the stomach and lower intestines by every thing not sweet or insipid that passes through them; and from a degree of sensibility too exquisite for the precarious and fluctuating state of our nature: these are the vindictive, inexorable demons that arm every thought with the stings of scorpions, and render the sense of existence itself insupportable. We have heard of hypochondriacs who thought themselves made of glass; and of others who believed their persons grown to a size so enormous, that they could not enter into any door: but it has never been our fortune to be personally acquainted with any of these fantastics. Those with whom we have conversed were rather inclined to exaggerate real, than to create imaginary, evils; rather to anticipate gloomy possibilities, than to dwell upon improbable or chimerical catastrophes: the tender parent, therefore, or the faithful guardian, will beware of treating them with neglect or levity. He will suit his conversation, as much as possible, to the present tone of their feelings; he will avoid all innovations in their management, except such as are absolutely necessary for their cure.

Be careful never to reason nor expostulate with your patient on the nature of his malady. Tell him not that his uneasy feelings, far from being real, are the fictitious impositions of a depraved fancy. His disagreeable sensations will be more than sufficient to demonstrate the falsehood of your assertions: thus your argumentative and persuasive powers will not only be exerted in vain, but may considerably retard, if not finally prevent, his recovery; and may leave such indelible prepossessions against you, in his mind, as no length of time, no vicissitudes of life, will ever be able to efface. Opium has also been recommended; but excepting desperate cases, it will be found a fallacious and dangerous remedy:—fallacious, because the ease it gives is only temporary, and infallibly succeeded by sharper paroxysms:—dangerous, because it may be rendered habitual, and subject the patient to unmixed torment when omitted. Though we have already inculcated a regimen and exercise which appeared proper for the blind in general, and not incompatible with peculiar situations, it still seems necessary to add a few results of painful experience upon these subjects, as being particularly conducive to the present ease and future amendment of such as labour under the diseases now in question. And first, let it be observed, that animal food is their proper nutriment, as being of easiest digestion; better too, if well done upon the spit or gridiron: for instead of being allowed to imbibe

Blind.

adventitious.

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Fig. 6.



Fig. 7.



Fig. 8.



Fig. 1.

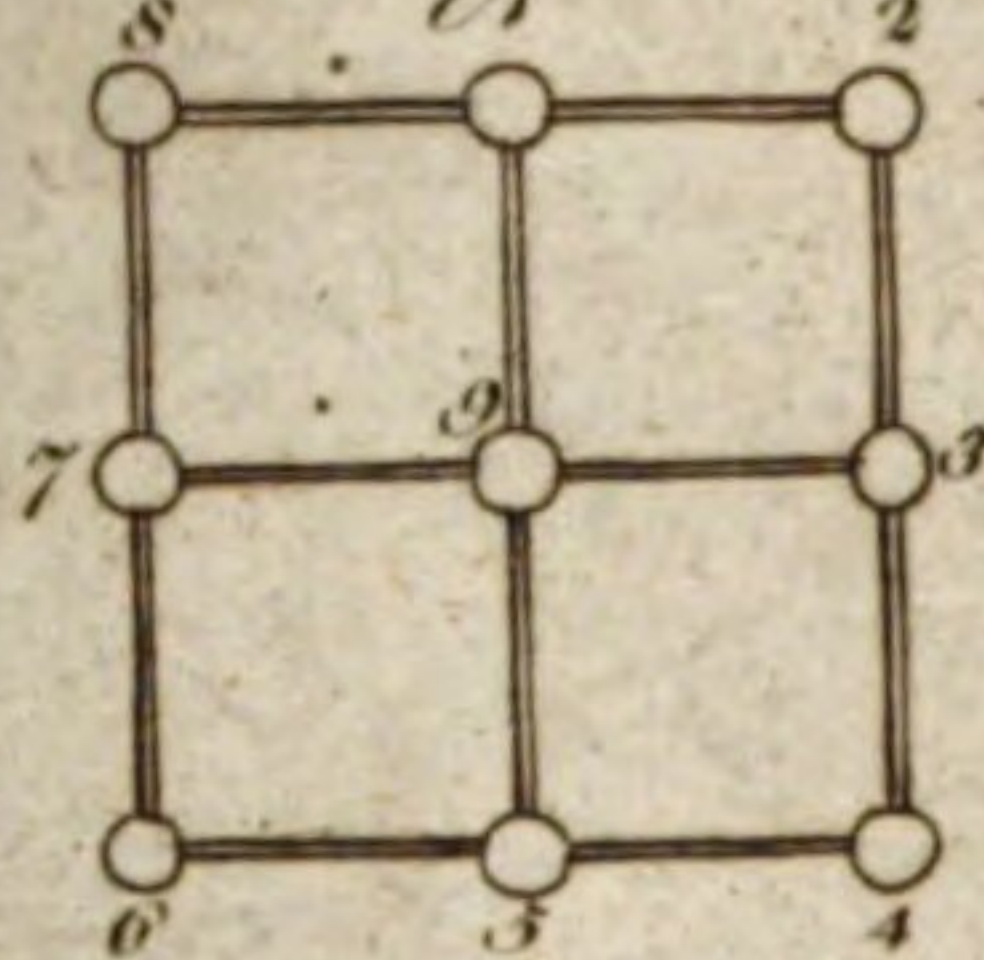


Fig. 2.



Fig. 5.

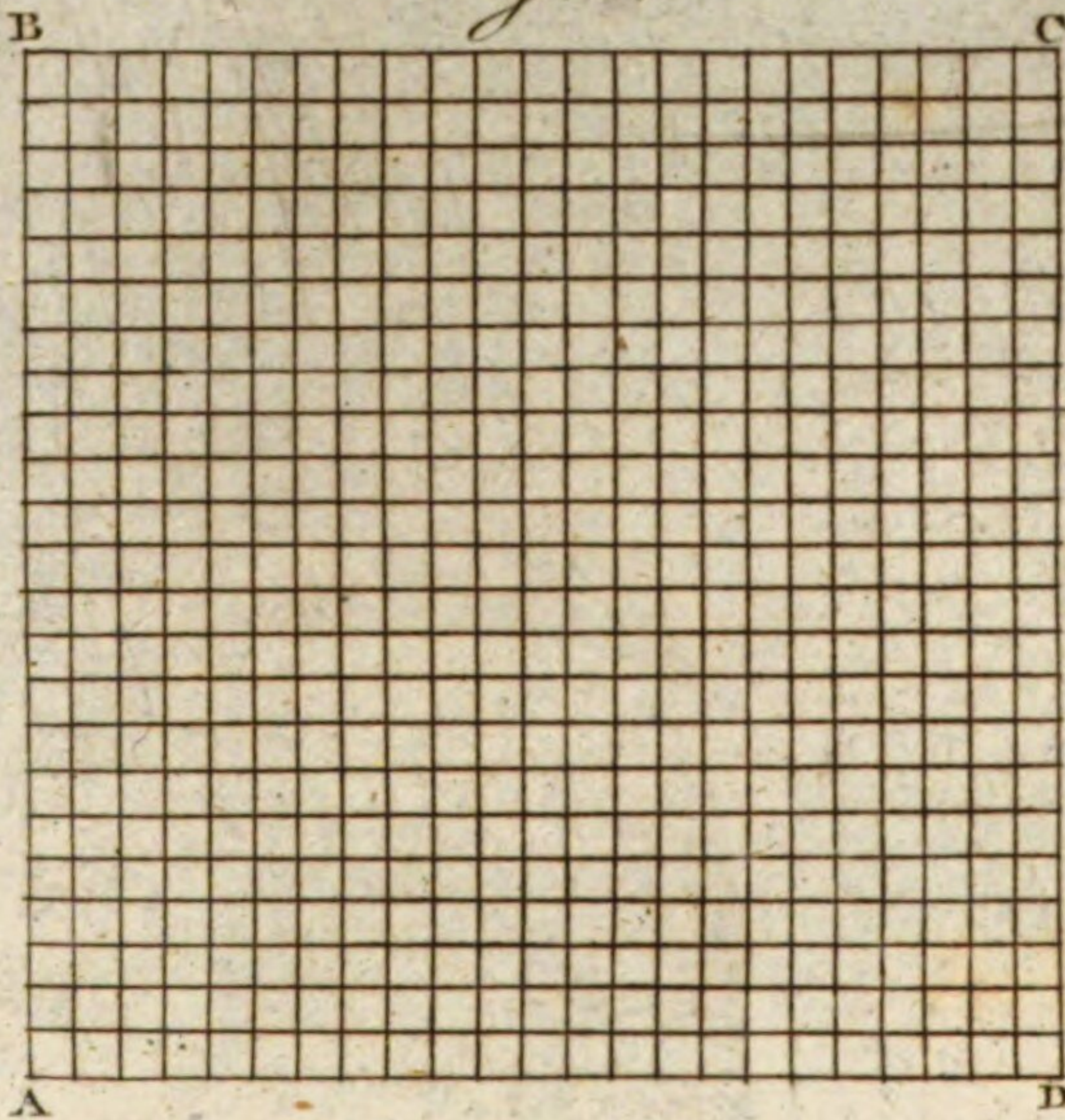


Fig. 3.

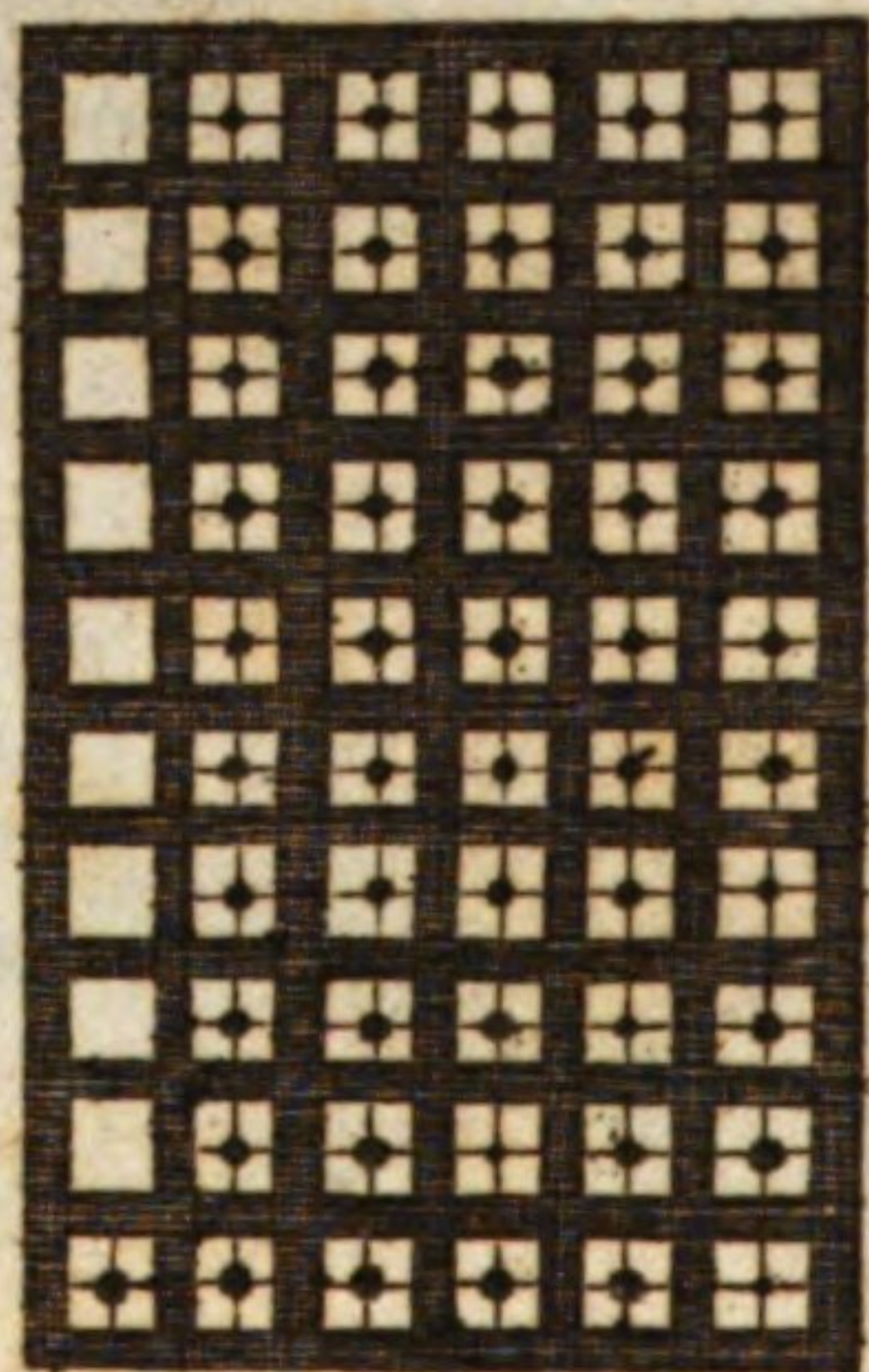


Fig. 4.

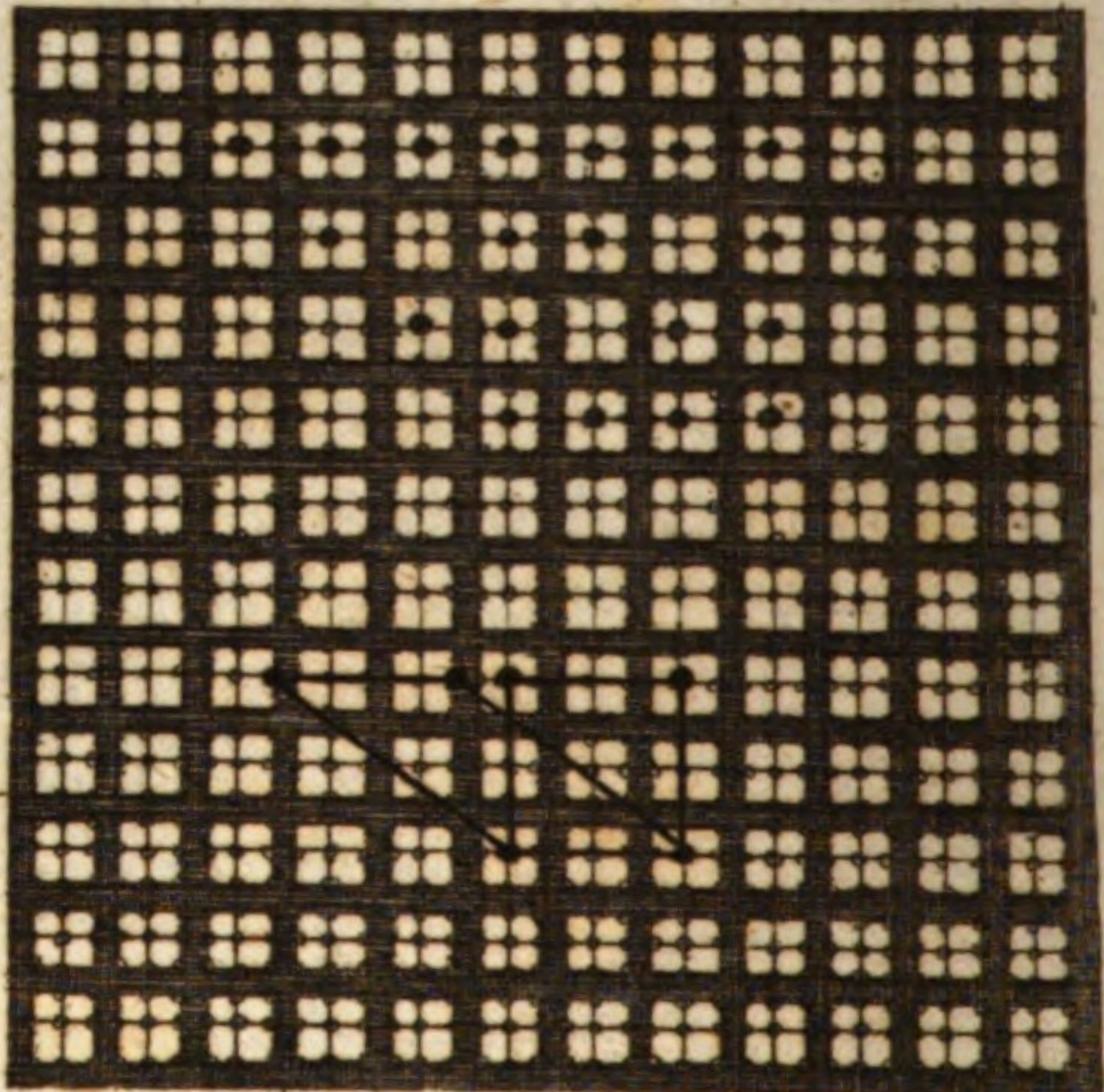
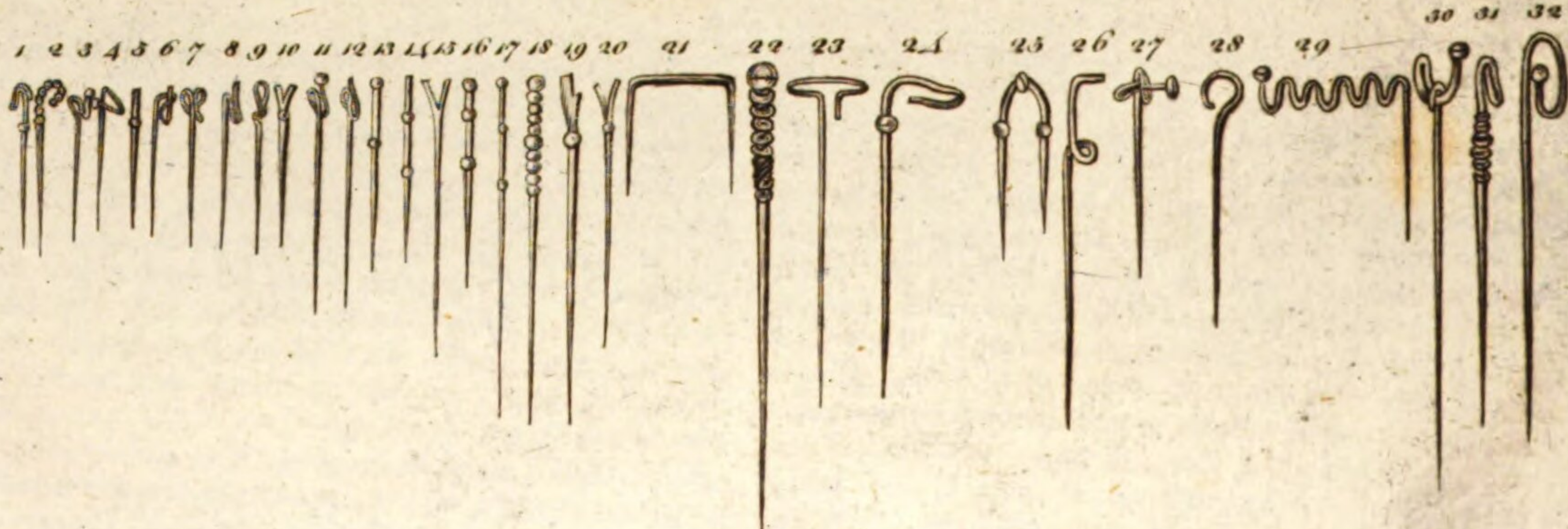
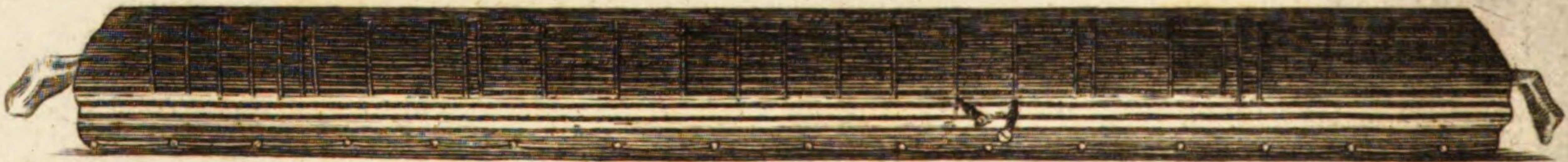


Fig. 9.



Blind.

adventitious fluids, it should be as much as possible drained of its own; neither should it be too fat: beef, mutton, or fowls, arrived at maturity, give the stomach least labour; veal, lamb, chickens, and every other kind of young meat, answer the purposes of nature with more difficulty, as the parts are not only too succulent, but prevented by their softness and lubricity from acting forcibly one upon another to facilitate the efforts of the stomach in digestion. Of all vegetable substances, white bread is perhaps the only ingredient which they can eat with the greatest impunity; and even this would still be safer were the paste formed with as little water as possible, and prepared without fermentation. Whether eggs are vegetable or animal substances, let physicians determine; but this we know, that by people in low spirits they may be eaten, even at supper, with great impunity. Every other herb or root is not only extremely flatulent, but productive of that sharp and intense acid for which we have formerly prescribed magnesia as the best remedy. Patients of this description should rather be frequent than liberal in their meals, and scrupulously careful of all heterogeneous mixture. Their most eligible beverage, except simple water, if they can afford it, is port wine, as being least convertible into that poignant fluid: porter likewise, if not stale, may, by its strength and bitterness, assist the action of the stomach. Neither of these fermented liquors should be taken in large quantities at once: let the clamours of nature be satisfied, and no more; for if the spirits are unnaturally elated, they will be certain to sink proportionably when the stimulus ceases to operate. The moderate use of genuine rum or brandy, properly diluted, when the other liquors cannot be had, may be productive of good effects, but should never be used at or near natural periods of repose; because, even when diluted, they occasion a febricity or pyrexia, incompatible with sound and refreshing sleep. Care should likewise be taken that the patient may never be too much warmed, either by cloaths or exercise, especially when in bed. Exertions of body, particularly in the open air, are indispensably necessary for promoting digestion and acquiring strength; but should never be carried to fatigue. The mind should likewise be diverted from attention to itself and its disorder, by reading and conversation. But there is an uncommon degree of discernment and delicacy requisite in the topics, that they may neither be too cheerful nor too serious, for the state of the mind, when they are applied. Neither let these injunctions be esteemed trivial: such little attentions, uniformly and tenderly exerted for their satisfaction, will contribute in no small degree to their present tranquillity, and of consequence to their future restoration. We have thought it necessary to expatiate thus far, on a subject gloomy and forbidding in itself, but of sufficient importance to demand particular attention; and, besides, what we have said may not only be useful to the blind in particular, but applicable to all those who labour under the same depression. It only remains to add, that the order, the periods, and the quantities, in which the remedies above enumerated should be applied, must be determined by

wisdom and experience, or regulated by the advice of a skilful and vigilant physician. We are sorry that truth obliges us to acknowledge, that we have found the faculty less intelligent in this disease, and less attentive to its various aspects, than could be wished, or than its malignity requires.

The natural curiosity of children renders them extremely and indefatigably inquisitive. This disposition is often peculiarly prevalent in the blind. Parents and tutors, therefore, should gratify it whenever their answers can be intelligible to the pupil; when it is otherwise, let them candidly confess the impossibility or impropriety of answering his questions. At this period, if their hearts be tender and their powers inventive, they may render his amusements the vehicles, and his toys the instruments, of improvement: why, for instance, may not the centrifugal and centripetal forces be illustrated from the motion of a top, or the nature and power of elasticity by the rebound of a ball? These hints may lead to others, which, if happily improved and applied, may wonderfully facilitate the progress of knowledge. Nor will the violence of exercise, and the tumult of play, be productive of such perils and accidents as may be apprehended.

For the encouragement of such parents as choose to take these advices with regard to exercise, let us inform them, that though, till the age of twenty, some blind persons were on most occasions permitted to walk, to run, to play at large, they have yet escaped without any corporeal injury from these excursions.

Parents of middle, or of higher rank, who are so unfortunate as to have blind children, ought, by all possible means, to keep them out of vulgar company. The herd of mankind have a wanton malignity, which eternally impels them to impose upon the blind, and to enjoy the painful situations in which these impositions place them. This is a stricture upon the humanity of our species, which nothing but the love of truth and the dictates of benevolence could have extorted from us. But we (F) have known some who have suffered so much from this diabolical mirth in their own persons, that it is natural for us, by all the means in our power, to prevent others from becoming its victims.

Blind people have infinitely more to fear from the levity and ignorance, than from the selfishness and ill-nature, of mankind. In serious and important negotiations, pride and compassion suspend the efforts of knavery or spleen; and that very infirmity, which so frequently renders the blind defenceless to the arts of the insidious, or to the attempts of malice, is a powerful incentive to pity, which is capable of disarming fury itself. Villany, which frequently piques itself more upon the arts by which it prevails, than upon the advantages which it obtains, may often with contempt reject the blind, as subjects beneath the dignity of its operation; but the ill-natured buffoon considers the most malicious effects of his merriment as a mere jest, without reflecting on the shame or indignation which they inspire when inflicted on a sensible temper.

But vulgar credulity and ignorance are no less dangerous

Blind.

31
Natural curiosity to be gratified when possible; when otherwise, a reason to be given.

32
The blind not to be indulged in promiscuous company.

(F) The author of these observations, though he chooses to express himself in this manner, is blind.

Blind.

33
They must
not be per-
mitted to
hear mar-
vellous and
frightful
tales.

34
The asso-
ciation be-
tween
darkness
and spec-
tres found-
ed in na-
ture.

35
The me-
thod of dis-
sipating the
fears of the
blind.

36
The inven-
tion of the
blind may
be assisted,
but neither
anticipated
nor check-
ed.

gerous to those who want sight, than the false and me-
chanical wit so universally practised in common life. We know, we sympathetically feel, the strong propen-
sity of every illiterate mind, to relate or to believe what-
ever is marvellous and dreadful. These impressions, when early imbibed, can scarcely be eradicated by all the conspiring efforts of mature reason and confirmed experience. Those philosophers who have attempted to break the alliance between darkness and spectres, were certainly inspired by laudable motives. But they must give us leave to assert, that there is a natural and essential connection betwixt night and *orcus*. Were we endued with senses to advertise us of every noxious object before its contiguity could render it formidable, our panics would probably be less frequent and sensible than we really feel them. Darkness and silence, therefore, have something dreadful in them, because they supersede the vigilance of those senses which give us the earliest notices of things. If you talk to a blind boy of invincible beings, let benevolence be an inseparable ingredient in their character. You may, if you please, tell him of departed spirits, anxious for the welfare of their surviving friends; of ministering angels, who descend with pleasure from heaven to execute the purposes of their Maker's benignity; you may even regale his imagination with the sportive gambols and innocent frolics of fairies; but let him hear as seldom as possible, even in stories which he knows to be fabulous, of vindictive ghosts, vindictive fiends, or avenging furies. They seize and pre-occupy every avenue of terror which is open in the soul; nor are they easily dispossessed. Sooner should we hope to exorcise a ghost, or appease a fury, than to obliterate their images in a warm and susceptible imagination, where they have been (habitually impressed, and where these feelings cannot be dissipated by external phenomena. If horrors of this kind should agitate the heart of a blind boy which may happen notwithstanding the most strenuous endeavours to prevent it), the stories which he has heard will be most effectually discredited by ridicule. This, however, must be cautiously applied, by gentle and delicate gradations. If he is inspired with terror by effects upon his senses, the causes of which he cannot investigate, indefatigable pains must be taken to explain these phenomena, and to confirm that explanation, whenever it can be done, by the testimony of his own senses, and his own experience. The exertion of his locomotive and mechanical powers (the rights of which we have formerly endeavoured to assert) will sensibly contribute to dispel these terrors.

His inventive faculties ought likewise to be indulged with the same freedom. The data which they explore may be presented in such a manner, as to render discoveries easy: but still let invention be allowed to co-operate. The internal triumph and exultation which the mind feels from the attainment and conviction of new truths, heightens their charms, impresses them deep

on the memory, and gives them an influence in practice of which they could not otherwise have boasted.

There are a sort of people in the world, whose views and education have been strictly confined to one province, and whose conversation is of consequence limited and technical. These, in literary intercourse, or fashionable life, are treated with universal contempt, and branded with the odious name of *mere men of business*. Nor is it any wonder that the conversation of such should prove nauseous and disgusting. It would be arrogance in them to expect, that indifferent persons should either enter into their private interests, or the peculiarities of their craft, with a warmth equal to their own. We have known the intrusion of such a person involve a numerous company in gloom, and terminate the freedom and vivacity of agreeable discourse in lazy yawning and discontented silence. Of all innocent characters, this ought to be avoided by the blind; because, of all others, it is the character which they run the greatest hazard of adopting. The limitation of their powers naturally contracts their views and pursuits, and, as it were, concentrates their whole intellectual faculties in one, or at best in few objects. Care should therefore be taken to afford the mind a theatre for its exertions, as extensive as possible, without diverting it from one great end, which, in order to excel, it ought for ever to have in prospect.

There are few sciences in which the blind have not distinguished themselves: even those whose acquisition seemed essentially to depend upon vision, have at last yielded to genius and industry, though deprived of that advantage. Mr Sanderson, whom we formerly mentioned, has left behind him the most striking evidences of astonishing proficiency in those retired and abstract branches of mathematics which appeared least accessible to persons of his infirmity. Sculpture (G) and painting are not, perhaps, the most practicable arts for a blind man; yet he is not excluded from the pleasing creation and extensive regions of fancy. However unaccountable it may appear to the abstract philosophers, yet nothing is more certain in fact, than that a blind man may, by the inspiration of the muses, or, to strip the figure of its mythological dress, may, by the efforts of a cultivated genius, exhibit in poetry the most natural images and animated descriptions, even of visible objects, without either incurring or deserving the imputation of plagiarism.

In the sister art of music, there are, at present, living and noble instances how far the blind may proceed.

If we look into former periods, we shall find illustrious and pregnant examples, how amply nature has capacitated the blind to excel both in the scientific and practical departments of music. In the 16th century, when the progress of improvement both in melody and harmony was rapid and conspicuous, Francisco Salinas was eminently distinguished. He was born A. D. 1513, at Burgos in Spain; and was son to the treasurer of

Blind.

37
The man-
ners of the
blind.

(G) Yet there are instances of persons who have been enabled to take the figure and idea of a face by the touch, and mould it in wax with the utmost exactness; as was the case of the blind sculptor mentioned by De Piles, who thus took the likeness of the Duke de Bracciano in a dark cellar, and made a marble statue of King Charles I. with great elegance and justness. Vid. *De Piles Cours de Peint.* p. 329. and *Wolf. Psychol. Rat.* § 162.

Blind.

of that city. Though afflicted with incurable blindness, he was profoundly skilled both in the theory and practice of music. As a performer, he is celebrated by his contemporaries with the highest encomiums. As a theorist, his book, if we may believe Sir John Hawkins, is equal in value to any now extant in any language. Tho' he was deprived of sight in his earliest infancy, he does not content himself to delineate the various phenomena in music, but the principles from whence they result, the relations of sound, the nature of arithmetical, geometrical, and harmonical ratios, which at that period were esteemed essential to the theory of music, with a degree of intelligence which would have deserved admiration though he had been in full possession of every sense requisite for these disquisitions. He was taken to Rome in the retinue of Petrus Sarmentus archbishop of Compostella; and having passed twenty years in Italy, he returned to Salamanca, where he obtained the professorship of music, an office at that time equally respectable and lucrative. Having discharged it with reputation and success for some time, he died at the venerable age of 77.

In the same period flourished Caspar Crumbhorn, blind from the third year of his age: yet he composed several pieces in many parts with so much success, and performed both upon the flute and violin so exquisitely, that he was distinguished by Augustus elector of Saxony. But preferring his native Silesia to every other country, he returned thither, and was appointed organist of the church of St Peter and Paul in the city of Lignitz, where he likewise had often the direction of the musical college, and died June 11th 1621.

To these might be added Martini Pesenti of Venice, a composer of vocal and instrumental music almost of all kinds, though blind from his nativity; with other examples equally worthy of public attention. But if vulgar prejudice is capable of blushing at its own contemptible character, or of yielding to conviction, those already quoted are more than sufficient to show the musical jugglers of our time, who are generally as absolute strangers to learning and taste as to virtue, that their art is no monopoly with which those alone who see are invested by the irreversible decree of heaven.

For Sanderfon's method of calculation, both in arithmetic and algebra, see the account prefixed to his own treatise on that subject. But there is a much fuller and more circumstantial detail both of its nature and its various uses, given by Mr Diderot in his "Letter concerning the Blind, for the use of those who see," which we shall here translate.

38

Sanderfon's
plan of no-
tation.

"It is much easier (says that author) to use signs already invented, than to become their inventor; as one is forced to do, when engaged in circumstances for which he is not provided. Of what advantage might not this be to Sanderfon to find a palpable arithmetic already prepared for him at five years of age, which he might otherwise have felt the necessity of inventing for himself at the advanced period of twenty-five? This Sanderfon, Madam, is an author deprived of sight, with whom it may not be foreign to our purpose to amuse you. They relate prodigies of him; and of these prodigies there is not one, which his progress in belles

3

lettres, and his mathematical attainments, do not render credible.

Blind:

"The same instrument served him for algebraical calculations, and for the construction of rectilinear figures. You would not perhaps be sorry that I should give you an explication of it, if you thought your mind previously qualified to understand it; and you shall soon perceive that it presupposes no intellectual preparations of which you are not already mistress; and that it would be extremely useful to you if you should ever be seized with the inclination of making long calculations by touch.

"Imagine to yourself a square, such as you see PL. XCVIII. fig. 1. divided into four equal parts by perpendicular lines at the sides, in such a manner, that it may present you the nine points 1, 2, 3, 4, 5, 6, 7, 8, 9. Suppose this square pierced with nine holes capable of receiving pins of two kinds, all of equal length and thickness, but some with heads a little larger than the others.

"The pins with large heads are never placed any where else but in the centre of the square; those with smaller heads never but at the sides, except in one single case, which is that of making the figure 1, where none are placed at the sides. The sign of 0 is made by placing a pin with a large head in the centre of the little square, without putting any other pin at the sides*. The number 1 is represented by a pin with a small head placed in the centre of the square, without putting any other pin at the sides; the number 2, by a pin with a large head placed in the centre of the square, and by a pin with a small head placed on one of the sides at the point 1: the number 3, by a pin with a large head placed in the centre of the square, and by a pin with a small head placed on one of the sides at the point 2: the number 4, by a pin with a large head placed in the centre of the square, and by a pin with a small head placed on one of the sides at the point 3: the number 5, by a pin with a large head placed in the centre of the square, and by a pin with a small head placed on one of the sides at the point 4: the number 6, by a pin with a large head placed in the centre of the square, and by a pin with a small head placed on one of the sides at the point 5: the number 7, by a pin with a large head placed in the centre of the square, and by a pin with a small head placed on one of the sides at the point 6: the number 8, by a pin with a large head placed in the centre of the square, and by a pin with a small head placed on one of the sides at the point 7: the number 9, by a pin with a large head placed in the centre of the square, and by a pin with a small head placed on one of the sides at the point 8.

* See fig. 2.

"Here are plainly ten different expressions obvious to the touch, of which every one answers to one of our ten arithmetical characters. Imagine now a table as large as you please, divided into small squares, horizontally ranged, and separated one from the other at similar distances, as you see it in fig. 3. Thus you will have the instrument of Sanderfon.

"You may easily conceive that there is not any number which one cannot express upon this table; and, by consequence, no arithmetical operation which one cannot execute upon it.

39

This nota-
tion applied
to numeri-
cal opera-
tions.

"Let.

Blind.

"Let it be proposed, for instance, to find the sum, or to work the addition of the nine numbers following.

1	2	3	4	5
2	3	4	5	6
3	4	5	6	7
4	5	6	7	8
5	6	7	8	9
6	7	8	9	0
7	8	9	0	1
8	9	0	1	2
9	0	1	2	3

"I express them on the table in the order as they are dictated to me; the first figure at the left of the first number, upon the first square to the left of the first line; the second figure, to the left of the first number, upon the second square to the left of the same line; and so of the rest.

"I place the second number upon the second row of squares, units beneath units, and tens beneath tens, &c.

"I place the third number upon the third row of squares, and so of the rest. Then with my fingers running over each of the rows vertically from the bottom to the top, beginning with that which is nearest to my right, I work the addition of the numbers which are expressed, and mark the surplus of the tens at the foot of that column. I then pass to the second column, advancing towards the left; upon which I operate in the same manner; from thence to the third; and thus in succession I finish my addition.

40
The same
instrument
applied to
the con-
struction of
rectilinear
figures.

"We shall now see how the same table served him for demonstrating the properties of rectilinear figures. Let us suppose this proposition to be demonstrated, That parallelograms which have the same basis and the same height are equal in their surfaces. He placed his pins as may be seen fig. 4. He gave names to the angular points, and finished his demonstration with his fingers.

"If we suppose that Sanderfon only employed pins with large heads to mark the limits of his figures, around these he might arrange his pins with small heads in nine different manners, all of which were familiar to him. Thus he scarcely found any embarrassment but in those cases where the great number of angular points which he was under a necessity of naming in his demonstration obliged him to recur to the letters of the alphabet. We are not informed how he employed them.

"We only know, that his fingers ran over the board with astonishing agility; that he undertook with success the longest calculations; that he could interrupt the series, and discover his mistakes; that he proved them with the greatest ease; and that his labours required infinitely less time than one could have imagined, by the exactness and promptitude with which he prepared his instruments and disposed his table.

41
Prepara-
tion of the
instrument.

"This preparation consisted in placing pins with large heads in the centres of all the squares: having done this, no more remained to him but to fix their values by pins of smaller heads, except in cases where it was necessary to mark an unit; then he placed in the centre of a square a pin with a small head, in the place of a pin with a large head with which it had been occupied.

Blind.

"Sometimes, instead of forming an entire line with these pins, he contented himself with placing some of them at all the angular points, or points of intersection; around which he tied silk threads, which finished the formation of the limits of his figures." See fig. 4.

It may be added by way of improvement, that for the division of one series of numbers from another, a thin piece of timber in the form of a ruler with which lines are drawn, having a pin at each end for the holes in the squares, might be interposed between the two series to be distinguished.

This geometrician left other instruments behind him; but as we do not know their uses, we need not add their descriptions.

It must be owned, that by the rotation here exhibited every modification of number may be expressed, and of consequence every arithmetical operation successfully performed; but we have been recently favoured with another form of palpable arithmetic, which appears to us equally comprehensive and much more simple than that of Sanderfon. It was originally invented, and is still used in calculation, by Dr Henry Moyes; a gentleman whom we had formerly occasion to mention with merited applause in this article, and whose character and attainments we have endeavoured more fully to illustrate than had been done in the former edition, as well from personal knowledge as from the anecdotes of Dr Bew, as the most eligible introduction to the account of his notation, given in the words of his own letter, and exemplified in a figure copied from a drawing directed by himself.

"To the Editor of Encyclopædia Britannica.

"SIR, In compliance with your request, I send you the following brief account of a palpable notation which I have generally used for these 20 years to assist my memory in numerical computations. When I began to study the principles of arithmetic, which I did at an early period of life, I soon discovered to my mortification, that a person entirely deprived of sight could scarcely proceed in that useful science without the aid of palpable symbols representing the ten numerical characters. Being at that time unacquainted with the writings of Sanderfon, in which a palpable notation is described, I embraced the obvious, though, as I afterwards found, imperfect expedient of cutting into the form of the numerical characters thin pieces of wood or metal. By arranging these on the surface of a board, I could readily represent any given number, not only to the touch, but also to the eye; and by covering the board with a lamina of wax, my symbols were prevented from changing their places, they adhering to the board from the slightest pressure. By this contrivance, I could solve, though slowly, any problem in the science of numbers: but it soon occurred to me, that my notation, consisting of ten species of symbols or characters, was much more complicated than was absolutely necessary, and that any given number might be distinctly expressed by three species of pegs alone. To illustrate my meaning, let A, B, C, D, (fig. 5.), represent a square piece of mahogany a foot broad and an inch in thickness; let the sides A B, B C, C D, D A, be each divided into 24 equal parts; let every two opposite divisions be joined by a groove cut in the board sufficiently deep to be felt with the fin-

42
Dr Moyes's
form of a
palpable
notation.

ger,

Blind. ger, and let the board be perforated at each intersection with an instrument a tenth of an inch in diameter.

"The surface of the board being thus divided into 576 little squares, with a small perforation at each of their angles, let three sets of pegs or pins, resembling those represented in the plate at the figures 6, 7, 8, be so fitted to the holes in the board, that when stuck into them they may keep their positions like those of a fiddle, and require some force to turn them round. The head of each peg belonging to the first set is a right-angled triangle about one-tenth of an inch in thickness; the head of each peg belonging to the second set differs only from the former in having a small notch in its sloping side or hypotenuse; and the head of each peg belonging to the third set is a square of which the breadth should be equal to the base of the triangle of the other two. These pegs should be kept in a case consisting of three boxes or cells, each cell being allotted to a set, and the case must be placed close by the board previous to the commencement of every operation. Each set should consist of 60 or 70 pegs (at least when employed in long calculations); and when the work is finished, they should be collected from the board and carefully restored to their respective boxes.

Things being thus prepared, let a peg of the first set be fixed into the board, and it will acquire four different values according to its position respecting the calculator. When its sloping side is turned towards the left, it denotes one, or the first digit; when turned upwards, or from the calculator, it denotes two, or the second digit; when turned to the right, it represents three; and when turned downwards, or towards the calculator, it denotes four, or the fourth digit. Five is denoted by a peg of the second set, having its sloping side or hypotenuse turned to the left; six, by the same turned upwards; seven, by the same turned to the right; and eight, by the same turned directly down, or towards the body of the calculator. Nine is expressed by a peg of the third set when its edges are directed to right and left; and the same peg expresses the cypher when its edges are directed up and down. By three different pegs the relative values of the ten digits may therefore be distinctly expressed with facility; and by a sufficient number of each set the steps and result of the longest calculation may be clearly represented to the sense of feeling. It seems unnecessary to illustrate this by an example; suffice it to express in our characters the present year of the Christian æra 1788: Take a peg of the first set and fix it in the board with its sloping side turned towards the left equal to one; take now a peg of the second set and fix it in the next hole in the same groove, proceeding as usual from left to right, with its sloping side turned to the right, equal to 7; next take a peg of the same set and fix it in the next hole, with its sloping side turned downwards, equal to 8; lastly, take another peg of the same set, and place it in the next hole in the same position, equal to 8; and the whole will express the number required.

"When it is necessary to express a vulgar fraction, I place the numerator in the groove immediately above, and the denominator in that immediately below the groove in which the integers stand; and in decimal

arithmetic an empty hole in the integer-groove represents the comma or decimal point. By similar breaks I also denote pounds, shillings, pence, &c. and by the same expedient I separate in division the divisor and quotient from the dividend.

"This notation, which supplies me completely with coefficients and indices in algebra and fluxions, seems much superior to any of the kind hitherto made public in the west of Europe. That invented and described by Mr Grenville, having no less than ten sets of pegs, is by much too complicated for general practice; and that which we owe to the celebrated Sanderfon is apt to puzzle and embarrass the calculator, as the pegs representing the numerical digits can seldom or never be in the same straight line. If you agree with me that the above notation may promote the knowledge, and therefore the happiness, of persons denied the benefit of sight, you have my consent to give it a place in the present edition of your valuable work. I am, Sir, with respect, your obedient servant,

HENRY MOYES."

We have seen the machine above mentioned, which was exhibited to the society for the improvement of polite arts, &c. by Mr Grenville, who is himself also deprived of sight. But though this has met with the approbation of Mr Stanley, we cannot forbear to think it less simple in its structure than that of Dr Moyes's, more multiform in its apparatus, and of consequence more laborious and complex in the process of its operation; for where every single peg has only one power, and acquires no diversity of value from its position, their forms must be indefinitely varied and their numbers prodigiously multiplied; which must cost both the memory and judgment of the pupil numberless painful and fatiguing exertions before he contracts a habit of using the instrument with promptitude and success. On these accounts, a particular description of it is omitted in this place.

In the higher parts of mathematics, such as conic sections, the same solid figures which are mediums of perception to those who see, may perform the same useful office to the blind. But, for the structure of superficial figures, we should imagine, that a kind of matter might be found soft enough to be easily susceptible of impressions, yet hard enough to retain them till effaced by an equal pressure. Suppose, for instance, a table were formed, four feet broad and eight in length; for the figures, that they may be the more sensible to the touch, ought to be larger than ordinary. Suppose this table had brims, or a moulding round it, rising an inch above the surface: let the whole expanse, then, be filled with bees-wax, and the surface above pressed extremely even with a polished board, formed exactly to fit the space within the mouldings. This board will always be necessary to efface the figures employed in former propositions, and prepare the surface for new ones. We think we have pondered the minutest inconvenience that can arise from this method of delineating and conceiving geometrical truths; and, after all, the table appears to us the best and the least troublesome apparatus which a blind man can use. We can see no reason why general ideas of geography or topography might not be conveyed to him in the same manner, by spheres composed of or covered with the same impressible matter.

Blind.

43
A new mathematical instrument proposed.

44
Geographical instruments proposed for the blind.

Blind.

45
Account of
a new plan
for the im-
provement
of the blind.

Such were the mediums that occurred to the author, when this article was originally written, for conveying to persons deprived of sight those remote and complicated truths which vision alone was thought capable of representing; but a work has been lately published at Paris which supercedes every former attempt to promote or facilitate the improvement of the blind. The invention of a plan so arduous in its appearance and so practicable in its execution, demanded the highest exertions of the noblest genius to produce it, and the most strenuous efforts of indefatigable humanity to render it effectual. It is intitled, "An Essay on the Education of the Blind." Its object is to teach them, by palpable characters impressed on paper, not only the liberal arts and sciences, but likewise the principles of mechanical operation, in such a manner, that those who have no genius for literary improvement may yet become respectable, useful, and independent members of society, in the capacity of common artificers. By these tangible signatures they are taught to read, to write, and to print; they are likewise instructed in geometry, in algebra, geography, and, in short, in every branch of natural philosophy. Nor are their efforts circumscribed by mere utility; a taste for the fine arts has likewise been cultivated among them. They have been taught to read music with their fingers as others do with their eyes; and though they cannot at once feel the notes and perform them upon an instrument, yet are they capable of acquiring any lesson with as much exactness and rapidity as those who enjoy all the advantages of light. But we shall give a more particular account of the wonderful topics contained in this essay. In his first chapter the author discovers the end proposed by that delineation of culture which he offers to the blind; it is to enlarge their sphere of knowledge, and of consequence to increase their capacities and improve their powers of action, so that they may become happy and independent in themselves, and useful and agreeable to others. The 2d chapter contains an answer to the objections urged against the general utility of this institution. These objections are candidly stated, and answered in the most satisfactory manner; but were we to recapitulate them in detail, it would protract this article to a length much beyond its due proportion, even upon the extended plan of the Encyclopædia. The 3d chapter treats of reading as adapted to the practice of the blind. The 4th chapter consists of answers to various objections against the method of reading proposed for the blind; but these, for reasons formerly given, we cannot with propriety delineate in this article. In the 5th chapter is shown the art of printing as practised by the blind for their peculiar use. In the 6th chapter is described the manner of teaching the blind the art of printing for those that see. In the 7th is represented the manner of teaching the blind to write. The 8th chapter explains the method of teaching the blind arithmetic; the 9th, geography; the 10th, music. The 11th, contains an account of the mechanic arts in which the blind are employed, and of the way by which they are formed for such occupations. The 12th shows in general the proper manner of instructing the blind, and draws a parallel between their education and that of the deaf and dumb. Chapter 13th treats of the method of instructing them in the languages, mathe-

6

matics, history, &c. What remains of the books is taken up with notes which illustrate each particular chapter; a short historical account of the rise, the progress, and the present state, of the academy for the formation of the blind; an ode on the cultivation of the blind, by one that laboured under that affliction; an extract from the register of the royal academy of sciences; opinion of the printers; models of the various pieces which blind children are capable of printing; and an account of the exercises performed by blind children in presence of the king, queen, and royal family, during the Christmas solemnities 1786. Thus having given a cursory view of the various topics contained in the essay, we proceed to give some account of the manner in which the blind print and write. The blind compositor, then, has a box for every alphabetical character in use; on the outside of these boxes are palpably marked the peculiar character belonging to each; they are filled with types, which he chooses and sets as they are called for, but not in the position in which they are to be read; on the contrary, they are inverted as objects are seen painted on the retina of an eye by an optician. Having thus fixed and arranged his types, he chooses a page of the strongest paper that can be found, which he gently moistens in a degree sufficient to render it more easily susceptible of impressions, without being dilacerated or worn by the shock which it must afterwards undergo. He then lays it upon the types; and by the cautious operation of the press, or by the easy strokes of a little hammer, which are frequently repeated over the whole expanse, he causes the impression of the type to rise on the opposite side of the paper, where, when dry, it continues not only obvious to the sight but the touch, and is far from being easily effaced. On the upper side of the paper the letters appear in their proper position, and by their sensible elevation above the common surface render it practicable for the blind to read them with their fingers. Their manner of writing is analogous to this operation: the pupil, by repeated experiments, having familiarised himself to the forms of the letters, both in their inverted and in their proper position, gradually learns to delineate them upon paper, moistened as before, with the point of an iron pen, which has no split, and which is just sharp enough to impress without piercing the paper: thus, on the side next to the writer's hand, the letters are formed sunk and inverted; but when the paper is turned they appear right and *in relief*. Thus the blind are enabled to form and decypher, not only the characters required in common language, but also mathematical diagrams, arithmetical and geographical processes, and all the characters used in the written language of music. If this account should appear incredible to any of our readers, let him be informed, that the author of this article has conversed with two gentlemen of learning and veracity who saw the blind perform all the wonders here recapitulated with astonishing success, to the universal satisfaction of numberless spectators whom curiosity and compassion impelled to visit the academy, that they might behold with their own eyes a spectacle so interesting to humanity. Let the incredulous be also informed, that the composer of the article has in his own hands a copy of this work now reviewed, which is printed and bound

by

Blind.

46
Printing
performed
by the
blind.

47
Their man-
ner of wri-
ting, &c.

Blind.

by the blind themselves. They exhibit at their own academy every Wednesday and Saturday between one and two o'clock at noon, to crowds of charitable admirers, by whose liberal donations the institution is now chiefly supported.

38
The blind
susceptible
of astrono-
my.

The knowledge of astronomy might likewise be of infinite use, both by enlarging the blind person's ideas of the universe, and by giving him higher and more confirmed impressions of that energy by which the stars are moved, and of that design by which their motions are regulated. But these objects are too vast; their distances, their magnitudes, their periods of revolution, are too complex to be apprehended in the mind, or impressed in the memory, without sensible mediums. For this purpose, an orrery, or some machine of a similar construction, will be indispensably requisite.

49
Of natural
philosophy.

The science of causes and effects might likewise yield him the most sublime and rational entertainment of which an intelligent being, in his present state, is susceptible. By this he might enter into the laws, the vicissitudes, the æconomy of nature. Nor is it absolutely necessary that he should be an ocular witness of the experiments by which these laws are detected and explained. He may safely take them for granted; and if, at any time, a particular experiment should prove faithless, he may, from general principles, be able to discover its fallacy, whether in the nature of the subject, the inaptitude of the instruments, or the process of the execution. The laws of motion, the various ratios or proportions of forces whether simple or compound, he may calculate and ascertain by the same means and in the same method so happily used by San-derfon.

50
Of moral
philosophy
and theo-
logy.

Moral and theological knowledge he may easily obtain, either from books, or instructions delivered *viva voce*. The last, if communicated by one who understands and feels the subject, with a proper degree of perspicuity and sensibility, are infinitely the most eligible. By morals, we would not merely be understood to mean a regular and inculpable series of action, but the proper exertion and habitual arrangement of the whole internal æconomy, of which external actions are no more than mere expressions, and from which the highest and most permanent happiness alone can proceed. By theology, we do not mean that systematic or scholastic jargon, which too frequently usurps its venerable name; but those sublime and liberal ideas of the nature and government of a Supreme being, whether discoverable by nature or revealed in scripture, which enforce every moral obligation, which teach us what is the ultimate good of our nature, which determine our efforts and animate our hopes in pursuing this most important of all objects. What Cicero says of the arts and sciences may with great propriety be applied to religion: *Nam cetera neque temporum sunt, neque ætatum omnium, neque locorum; et hæc studia adolescentiam alunt, senectutem oblectant, secundas res ornant, adversis perfugium ac solatium præbent: delectant domi, non impediunt foris; pernoctant nobiscum, perigrinantur, rusticantur.* Translated thus: 'For other studies are not suited to every time, to every age, and to every place: but these give strength in youth, and joy in old age; adorn prosperity, and are the support and consolation of adversity; at home they are delightful, and abroad they are

easy; at night they are company to us; when we travel, they attend us; and in our rural retirements, they do not forsake us.'

Blind.

To this may be added, that the joys of religion are for ever adequate to the largest capacity of a finite and progressive intelligence; and as they are boundless in extent, so they are endless in duration. We have already, more than once, observed, that the soul of a blind man is extremely obnoxious to melancholy and dejection. Where, therefore, can he find a more copious, intimate, permanent, and efficacious source of comfort than in religion? Let this then be inculcated with the utmost care and assiduity. Let the whole force of the soul be exerted in showing him that it is reasonable. Let all the noblest affections of the heart be employed in recommending it as amiable; for we will venture to assert, that the votary of religion alone is the man,—

*Quem, si fractus illabatur orbis,
Impavidum serient ruina:*

Thus translated;

Whom, though with nature's wreck oppress'd,
Unmanly fears could ne'er infect.

When the situation of the blind, and its natural effects upon their characters, are considered; when we reflect how exquisite their distresses, how pungent their disappointments, how sensible their regrets, how tedious and gloomy their periods of solitude; we must be wretches indeed, if we can grudge either labour or expence in procuring them every source of entertainment, which, when procured, remains in their own power, and yields what may be in some measure termed *self-derived enjoyment*. These amusements are prolific of numberless advantages: they afford us at once entertainment and exertion; they teach us to explore a thousand resources for preservation and improvement, which would otherwise have escaped our attention; they render us awake and sensible to a thousand notices both of external and intellectual objects, which would otherwise have passed unobserved.

Thus far have we proceeded without mentioning philological learning; though we know it to be attainable by the blind in a high degree, and though we are conscious of its importance both to their use and ornament. But as it is not indispensable, and as its acquisition is tedious and operose, we thought it less necessary to be early and minutely specified. We cannot doubt, that learning different languages adds to the treasure of our ideas, and renders those which we possess more clear and definite. It must be acknowledged, that the possession of other languages elucidates our own. The technical terms of almost every science are exotic; and without clearly understanding those, we cannot properly possess the ideas of which they are the vehicles. But these motives are common to every candidate for philological improvement with the blind.

The paths of grammar, however, are dry and rugged; and it will be necessary for the pedagogue, who-⁵¹ ever he is, to take all the opportunities that offer of enlightening the darkness and polishing the asperities of the road. When, therefore, the intellect of the pupil begins to open and exert its penetration, it will

Blind.

be proper to show him how the nature, the forms, and arrangements, of words, flow from our ideas and their relations. Every substance must naturally be in some state; it must either act, or be acted upon. The actions which it performs or suffers must be performed or suffered in some definite manner or degree. It must likewise have some qualities, whether temporary and accidental, or natural and permanent. These qualities must likewise be susceptible of degrees. When different substances are considered in the same state, its common participation forms a connection: when regarded in different states, that difference forms an opposition. The constant repetition of the names of substances and qualities produces a disagreeable monotony in language. They must therefore be implied in other words, which likewise in some cases serve to connect the parts of a sentence. There is a difference between such words as imply the connection of sentences, and such as imply the connection of states or circumstances. Actions to be performed or suffered may be either positively affirmed of any substance, or merely attributed to them. Living and percipient substances have immediate sensations of pain or pleasure, which likewise are productive of desire and aversion. To these sentiments particular sounds are adapted, whether immediately inspired by nature, or resulting from association and tacit convention.

Thus we have a foundation for all the different parts of speech; and from their natures and offices their forms and arrangements may be deduced, according to the analogy of every language.

52
The blind
susceptible
of logic, hi-
story, and
the belles
lettres.

The art of reasoning, the knowledge of history, and a taste for the *belles lettres*, are easily attainable by the blind; and as they are copious funds of entertainment, they should be inculcated, though at the expence of care and labour.

53
A compa-
nion should
be united to
the blind
by more
than the
ties of in-
terest and
conveni-
ency.

The relations of persons subjected to this misfortune, if in easy circumstances, will find it highly conducive to the improvement of their charge, to select some one among his coevals, of a sound understanding, a sweet and patient temper, a docile mind, a warm heart, and a communicative disposition. These two should be taught to find their interest and happiness in their connection one with another. Their bed, their board, their walks, their entertainments, their lessons, should be common. These are the best eyes with which art can endow a blind man: and if properly selected, they will on some occasions yield very little, in utility and perfection, to those of nature; nay, at some junctures they may be preferable.

54
Music one
of the most
proper em-
ployments
for the
blind. Me-
diocrity,
however,
pernicious.

If the blind must depend upon the exercise of their own powers for bread, we have already pointed out music as their easiest and most obvious province; but let it at the same time be remembered, that mediocrity in this art may prove the bitterest and most effectual curse which a parent can inflict upon his offspring, as it subjects them to every vicious impression or habit which may be imbibed or contracted from the lowest and most abandoned of mankind. If your pupil, therefore, be not endowed with natural talents exquisitely proper both for the theory and practice of this art, suffer him by no means to be initiated in it. If his natural genius favours your attempts, the spinet, harp, or organ, are the most proper instruments for him to be-

gin: because by these instruments he may be made more easily acquainted with the extent of musical scales, with the powers of harmony, with the relations of which it is constituted, and of course with the theory of his art. It would be not only unnecessary, but impracticable, to carry him deep into the theory, before he has attained some facility in the practice. Let, therefore, his head and his hands (if we may use the expression) be taught to go *pari passu*. Let the one be instructed in the simplest elements, and the others conducted in the easiest operations, first: contemplation and exercise will produce light in the one and promptitude in the other. But as his capacity of speculation and powers of action become more and more mature, discoveries more abstract and retired, tasks more arduous and difficult, may be assigned him. He should be taught the names and gradations of the diatonic scale, the nature and use of time, the diversity of its modes whether simple or mixed. He should be taught the quantity or value of notes, not only with respect to their pitch, but to their duration. Yet, let him be instructed not to consider these durations as absolutely fixed, but variable according to the velocity of the movements in which they are placed. Thus we reckon a semibreve equal to 4 vibrations of a pendulum; a minim to 2; a crotchet to 1, &c. But if the number of aliquot parts, into which a semibreve is divided, be great, and consequently the value of each particular part small, the minim, crotchet, quaver, &c. will increase in their intrinsic durations, though they must always preserve the same proportions relatively one to another. He should never be habituated to take a piece of music, either from the sound of a voice or an instrument. His companion ought to read the music by the names and values of its character, with the same exactness as the words in any other language. When he becomes a considerable adept in the art, tangible signs may be invented, by which he may not only be enabled to read, but even to set, music for himself. Such exercises will render him infinitely more accurate, both in his principles and practice, than he would otherwise be.

There is a hint of such tangible signs given in Tansure's musical grammar, p. 93. and which, though (like the rest of the book) obscure and indigested, may be improved and applied with advantage.

For the sake of those in whose hands it may not be, we quote the passage at length.

55
Scheme of
musical no-
tation.

"As it is the pleasure of the Almighty, that some persons are destitute of *eye-sight*; in like manner it is his infinite goodness to make them a double amends another way, by giving them a greater share of memory, &c. whereby they become very dexterous in playing on musical instruments, mathematics, &c. as we may observe by Dr Stanley organist of St Andrew's Holburn in London, the blind professor of mathematics in the university of Cambridge, and many others too tedious here to mention, who were born *blind*, and never saw the least glance of light; yet God gave them such a light in *knowledge*, that they became the wonder of all such as had the benefit of seeing, &c.

"And as *blind persons*, at first, cannot possibly have so clear an idea of *notes* and *musical characters* as they that

Blind.

that, by *feeling*, they may understand notes, and Blind. learn any tune that shall be set them, in their master's absence.

Blind.

" If the practitioner only wishes to write harpsichord music, the cushion may be what length he pleases, and about five or six inches wide: the strings must be sewed in the following order; beginning with the first

Blind.

or lowest, near the edge of the cushion; four small ones, which correspond with the notes in the base of the instrument ff, rr, cc, ee: Next five large ones, for the stave which correspond with the lines in the book, or notes in the instrument, g, b, d, f, r; one small one, which represents the occasional line between the base and treble, or middle c; five large ones for the treble stave, which make the notes e, g, b, d, f; three small ones, which represent the leger lines when the music goes in alt. These provide for the note a in alt, c in alt, and e in alt; in the space above which, next the edge of the cushion, the f in alt is wrote, when it is wanting, which completes the compass of the instrument.

"Those who only sing or play on single instruments, such as violins, &c. should have their cushions not above half the width of those above-mentioned, upon which there should be but one stave, and that in the following order:—Two small lines at bottom, five large ones in the middle, and three small ones at top. Neither of the outside lines of these small cushions should be sewed close to the edge, as there are notes supposed above and below. At either end of these small cushions, there should be a small wire staple, in order that any number of them may be combined together at pleasure, by running a rod through the staples: this will enable the practitioner to write what musicians call SCORE, in any number of parts he pleases; and by this means a thorough knowledge of the great works of Handel, and all other classical authors, may be acquired as well without sight as with it.

"The characters used to write on this machine are pins; some with two, three, or more heads; others bent in different forms—some, the heads taken off and the top beat flat; some of these are split; others the heads taken off, and placed near the middle. The bars are pieces of wire crooked at each end; a double bar is made by placing two single ones close together; a double sharp and double flat in the same manner.

"The characters are kept in a box in the same style as the printer keeps his types; each different compartment of which must be marked with a character in writing, signifying what each, contained in the several compartments, is intended to represent. That the master may be acquainted with them, the student must be taught to distinguish each of the characters contained in the box by the feel, as well as the names of each line and space upon the cushion. When he can do this readily, some music should be read to him, which it will be well for him to copy on the cushion: and when that is filled, let it be laid on the desk of the harpsichord before him; and then by feeling over a passage or sentence at a time, and afterwards playing it, his playing always commencing with the beginning of the piece, or at some particular part of it, this will soon enable him to recollect the whole, when the hands are taken off the cushion, to play what has been last felt. One of those characters, called a direct, must be placed against the note to be next felt: This will enable the student to go on again, after playing, without any difficulty. The person who reads the music, must be instructed not to call the lines or spaces by the letters which distinguish them, lest confusion may ensue, every eighth being the same; but must read in the following manner: first the name of the character must be mentioned, whether minim, crotchet, or quaver,

&c. then the line or space; as for example, minim on the first line, crotchet on the first space, quaver on the second, &c. &c. When the music exceeds the compass of the stave, it must be particularly mentioned whether above or below, first calling the character, then the leger line or space.

"The technical term at the beginning of each piece, is better remembered than wrote down on the machine: The accidental terms, which are best marked by placing some character, not much used, either above or below the note on which it happens, the ingenious mind will find out a method of doing for itself.

"This machine will not only teach music; but calling the characters letters, any one will be enabled to spell, read, or write down his sentiments on any subject, and even convey them to his friend without the assistance of a secretary. Arithmetic may be also taught upon this machine; as by calling the dot 1, and the pause 10, a complete set of figures will be formed.

"*Explanation of the figures.* A, B, C, D, the form of the cushion, which in its full size is about three feet long, and five inches and three quarters wide, having thereon a representation of musical notes, shown by different pins stuck on it. The lines a, b, c, d, e, are of large packthread; and the lines f, g, h, are of small twine.

"Pins, N^o 1. A semibreve. 2. A semibreve rest. 3. A minim. 4. A minim rest. 5. Dots. 6. A crotchet. 7. A crotchet rest. 8. A quaver. 9. A quaver rest. 10. A sharp. 11. A semiquaver. 12. A semiquaver rest. 13. A demiquaver. 14. A demiquaver rest. 15. A flat. 16. A demisemiquaver. 17. A demisemiquaver rest. 18. A semidemiquaver. 19. A semidemiquaver rest. 20. A natural. 21. Bars. 22. A direct. 23. A tie. 24. Bass. 25. Tenor cliff. 26. Treble cliff. 27. A repeat. 28. Pause. 29. This character placed on any line or space, signifies as many notes on that line or space as there are doubles on the pins; if turned upwards, it implies the same number ascending; if downward, that number descending. 30. A beat or inverted shake. 31. A shake; and where there is a dot placed over it, signifies a turned shake. Two dots placed over each other, above the notes, without this character, signify a turn only. 32. This character is used over the note to signify *forte*; and if a dot is placed above it, *fortissimo*: if the dot is placed above the note and below the character, it implies *crescendo*; if the character is placed below the note, it signifies *piano*; and if a dot is placed under it, *pianissimo*; but if the dot is above the character, and below the note, it signifies *diminuendo*. In concertos, the inventor uses the same character placed above the note in the same manner, with two dots over it to signify *tutti*: and below the notes, with two dots under it, to signify *solo*: in vocal music, the same character above the notes, with three dots over it, signifies *symphony*; and below the notes, with three dots under it, signifies *song*."

It is certain, that when playing concertos, or, if you please, when performing in *score*, the blind must depend upon memory, and upon memory alone: but happily their retentive powers are remarkably strong; and there are few pieces in music which will be found either too intricate to be acquired, or too long to be remembered, by a person deprived of sight. Mr Stanley, the gentleman

Blind.

Blind.

gentleman formerly mentioned by Tansure, performs what is still more astonishing. If our information, which we cannot doubt, be true, he accompanies any lesson with a thorough bass, though he never has heard it before. We have never yet heard of any person, tho' blessed with the full use of sight, and with all the advantages accruing from it, who could thus anticipate harmony before the chords were sounded, and accompany it in a manner suitable to its nature.

When he becomes a more profound theorist, if he has adopted the notion that music and geometry are congenial and inseparable (which, however, in our judgment is frivolous), he may peruse Malcom's Essay on Music, and Treydell's Theory and Practice of Music. But if he chooses to hear the same principles delivered without that unnecessary parade and ostentation of profundity, let him be instructed by D'Alembert (see the article Music in this Dictionary); by Rameau, in his principles of composition; and by Rousseau's Musical Dictionary (the substance of which is engrossed in the present Work, either under the respective detached articles, or in the notes added to the article Music). It is true, that the forms and proportions of instruments, the thickness, length, and tension of musical strings, may be mathematically adjusted; their relations one to another may be determined by the coincidence of their vibrations, or by the number and velocity of these vibrations when dissonant; but experience and a good ear are amply sufficient for these purposes. Yet, if the necessity of geometry in music should still remain an indelible article in his creed, he may peruse Dr Smith's Philosophical Principles of Harmony. There has also lately been published an explication of Tartini's theory, intitled, *The Principles and Power of Harmony*; which, after he has made considerable progress, may be read to him with sensible improvement.

57
Apostrophe
to the pu-
blic.

THUS we have endeavoured to form an estimate of the inconveniences suffered, and the advantages possessed, by the blind; we have attempted to show, of what kind of culture their remaining faculties are susceptible, and what appeared to us the easiest and properest means of their improvement. We have illustrated not only its possibility, but its certainty, by incontestable facts, which demonstrate, even in the eyes of scepticism and incredulity, to what degrees of eminence, both in the mechanical and liberal arts, the blind may be carried. It now remains to demand a categorical answer from society, Whether it is more humane and eligible, that such unhappy persons should be suffered to languish out their lives in torpid and miserable obscurity, wretched in themselves, and burdensome to others; or to cultivate and improve their powers in such a manner, as that they may be qualified for internal enjoyment and public utility? Surely there is not a human being, who does not disgrace the works of God, that can be at any loss in answering this question. Have we not then a right to call the world to an account? have we not a right to demand, why rational beings susceptible of felicity in themselves, and capable of transfusing happiness through the societies with whom they are connected, should be abandoned to a state of insignificance and misery? Is it possible that men who are every moment subjected to the same contingencies with which they behold their fellow-creatures afflicted, should not

Blind.

with all their souls endeavour to alleviate the misfortunes of their suffering brethren? Is the native and hereditary portion of human wisdom so light and supportable in itself, that we should neglect and despise those to whom it is embittered by accidental circumstances of horror and distress? You who are parents, who feel the strong and powerful pleadings of nature, do not, by a brutal negligence and insensibility, render the existence which you have given a curse to its possessors. Do not give them reason to upbraid your memory; and to answer those who ask what patrimony you have left them, that their sole inheritance was ignorance, incapacity, and indigence. You men of wealth and eminence, you whom Providence has rendered conspicuous on the theatre of nature, to whom it has given the noblest opportunities of participating the divine beatitude by the exercise of universal benevolence and genuine patriotism; yours is the glorious province of bringing neglected merit from obscurity, of healing the wounds inflicted by adverse fortune, and of cultivating those talents which may be exerted for your own advantage and the honour of your species. Thus you shall rise in the heraldry of heaven, and your names diffuse a lustre through the extent of space and the archives of eternity. Otherwise the temporary glare and parade of your situation can produce nothing else but a despicable mimicry of real and intrinsic greatness, and are no more than a splendid mask to cover what in itself is infamous or detestable.

By way of appendix to the preceding article, we shall add one or two very singular histories, with which it is hoped our readers will not be displeased.

An account of some remarkable particulars that happened to a lady after having had the confluent kind of small-pox. "In the course of this disease, during which the lady was attended by the late Sir Hans Sloane, several threatening symptoms appeared, which however were at length overcome; and the patient being thought out of danger, took several doses of such purgative medicines as are usually administered in the decline of the disease, without any bad consequence.

"But in the evening of the day on which she had taken the last dose that was intended to be given her on that occasion, she was suddenly seized with pains and convulsions in the bowels; the pain and other symptoms became gradually less violent as the force of the medicine abated, and by such remedies as were thought best adapted to the case, they seemed at length to be entirely subdued.

"They were, however, subdued only in appearance; for at eleven o'clock of the forenoon of the next day they returned with great violence, and continued some hours; when they went off, they left the muscles of the lower jaw so much relaxed, that it fell down, and the chin was supported on the breast. The strength of the patient was so much exhausted during this paroxysm, that she lay near two hours with no other signs of life than a very feeble respiration, which was often so difficult to be discerned that those about her concluded she was dead.

"From this time the fits returned periodically every day, at about the same hour. At first they seemed to affect her nearly in the same degree; but at length all the

Blind.

the symptoms were aggravated, the convulsions became more general, and her arms were sometimes convulsed alternately; it also frequently happened, that the arm which was last convulsed remained extended and inflexible some hours after the struggles were over. Her neck was often twisted with such violence, that the face looked directly backwards, and the back part of the head was over the breast; the muscles of the countenance were also so contracted and writhed by the spasms, that the features were totally changed, and it was impossible to find any resemblance of her natural aspect by which she could be known. Her feet were not less distorted than her head; for they were twisted almost to dislocation at the instep, so that she could not walk but upon her ancles.

"To remove or mitigate these deplorable symptoms, many remedies were tried; and, among others, the cold bath: but either by the natural effect of the bath, or by some mismanagement in the bathing, the unhappy patient first became blind, and soon afterwards deaf and dumb. It is not easy to conceive what could increase the misery of deafness, dumbness, blindness, and frequent paroxysms of excruciating pain: yet a very considerable aggravation was added; for the loss of her sight, her hearing, and her speech, was followed by such a stricture of the muscles of her throat, that she could not swallow any kind of aliment either solid or liquid. It might reasonably be supposed that this circumstance, though it added to the degree of her misery, would have shortened its duration; yet in this condition she continued near three quarters of a year; and during that time was supported in a very uncommon manner, by chewing her food only; which having turned often, and kept long in her mouth, she was obliged at last to spit it out. Liquors were likewise gargled about in her mouth for some time; and then returned in the same manner, no part of them having passed the throat by an act of deglutition: so that whatever was conveyed into the stomach, either of the juices of the solid food, or of liquids, was either gradually imbibed by the sponginess of the parts, which they moistened, or trickled down in a very small quantity along the sides of the vessels.

"But there were other peculiarities in the case of this lady, yet more extraordinary. During the privation of her *sight* and *hearing*, her *touch* and her *smell* became so exquisite, that she could distinguish the different colours of silk and flowers, and was sensible when any stranger was in the room with her.

"After she became blind, and deaf, and dumb, it was not easy to contrive any method by which a question could be asked her, and an answer received. This, however, was at last effected, by talking with the fingers, at which she was uncommonly ready. But those who conversed with her in this manner, were obliged to express themselves by touching her hand and fingers instead of their own.

"A lady who was nearly related to her, having an apron on, that was embroidered with silk of different colours, asked her, in the manner which has been described, if she could tell what colour it was? and after applying her fingers attentively to the figures of the embroidery, she replied, that it was red, and blue, and green; which was true. The same lady having a pink coloured ribbon on her head, and being willing still fur-

ther to satisfy her curiosity and her doubts, asked what colour that was? her cousin, after feeling some time, answered that it was pink colour: this answer was yet more astonishing, because it showed not only a power of distinguishing different colours, but different kinds of the same colour; the ribbon was not only discovered to be red, but the red was discovered to be of the pale kind called a *pink*.

"This unhappy lady, conscious of her own uncommon infirmities, was extremely unwilling to be seen by strangers, and therefore generally retired to her chamber, where none but those of the family were likely to come. The same relation, who had by the experiment of the apron and ribbon discovered the exquisite sensibility of her *touch*, was soon after convinced by an accident, that her power of *smelling* was acute and refined in the same astonishing degree.

"Being one day visiting the family, she went up to her cousin's chamber, and after making herself known, she intreated her to go down, and sit with her among the rest of the family, assuring her, that there was no other person present: to this she at length consented, and went down to the parlour door; but the moment the door was opened, she turned back, and retired to her own chamber much displeased; alleging, that there were strangers in the room, and that an attempt had been made to deceive her: it happened indeed that there were strangers in the room; but they had come in while the lady was above stairs, so that she did not know they were there. When she had satisfied her cousin of this particular, she was pacified; and being afterwards asked how she knew there were strangers in the room, she answered, by the smell.

"But though she could by this sense distinguish in general between persons with whom she was well acquainted and strangers, yet she could not so easily distinguish one of her acquaintance from another without other assistance. She generally distinguished her friends by feeling their hands; and when they came in, they used to present their hands to her, as a mean of making themselves known: the make and warmth of the hand produced in general the differences that she distinguished; but sometimes she used to span the wrist, and measure the fingers. A lady, with whom she was very well acquainted, coming in one very hot day, after having walked a mile, presented her hand as usual; she felt it longer than ordinary, and seemed to doubt whose it was; but after spanning the wrist, and measuring the fingers, she said, 'It is Mrs M. but she is warmer to-day than ever I felt her before.'

"To amuse herself in the mournful and perpetual solitude and darkness to which her disorder had reduced her, she used to work much at her needle; and it is remarkable, that her needle-work was uncommonly neat and exact: among many other pieces of her work that are preserved in the family, is a pin-cushion, which can scarce be equalled. She used also sometimes to write; and her writing was yet more extraordinary than her needle-work: it was executed with the same regularity and exactness; the character was very pretty, the lines were all even, and the letters placed at equal distances from each other: but the most astonishing particular of all, with respect to her writing, is, that she could by some means discover when a letter had by some mistake been omitted, and would place it over that part

Blind.

Blind. of the word where it should have been inserted, with a caret under it. It was her custom to sit up in bed at any hour of the night, either to write or to work, when her pain or any other cause kept her awake.

"These circumstances were so very extraordinary, that it was long doubted whether she had not some faint remains both of hearing and sight, and many experiments were made to ascertain the matter; some of these experiments she accidentally discovered, and the discovery always threw her into violent convulsions. The thought of being suspected of insincerity, or supposed capable of acting so wicked a part as to feign infirmities that were not inflicted, was an addition to her misery which she could not bear, and which never failed to produce an agony of mind not less visible than those of her body. A clergyman who found her one evening at work by a table with a candle upon it, put his hat between her eyes and the candle, in such a manner that it was impossible she could receive any benefit from the light of it if she had not been blind. She continued still at her work with great tranquillity; till putting up her hand suddenly to rub her forehead, she struck it against the hat, and discovered what was doing; upon which she was thrown into violent convulsions, and was not without great difficulty recovered. The family were by these experiments, and by several accidental circumstances, fully convinced that she was totally deaf and blind; particularly by sitting unconcerned at her work, during a dreadful storm of thunder and lightning, tho' she was then facing the window, and always used to be much terrified in such circumstances. But Sir Hans Sloane, her physician, being still doubtful of the truth of facts which were scarce less than miraculous, he was permitted to satisfy himself by such experiments and observations as he thought proper; the issue of which was, that he pronounced her to be absolutely deaf and blind.

"She was at length sent to Bath, where she was in some measure relieved; her convulsions being less frequent, and her pains less acute: but she never recovered her speech, her sight, or her hearing in the least degree.

"Many of the letters dated at Bath, in some of which there are instances of interlineations with a caret, the writer of this narrative hath seen, and they are now in the custody of the widow of one of her brothers, who, with many other persons, can support the facts here related, however wonderful, with such evidence as it would not only be injustice, but folly, to disbelieve."

An account of a French lady, blind from her infancy, who can read, write, and play at cards, &c.—"A young gentlewoman of a good family in France, now in her 18th year †, lost her sight when only two years old, her mother having been advised to lay some pigeons blood on her eyes, to preserve them in the small pox; whereas, so far from answering the end, it eat into them. Nature, however, may be said to have compensated for the unhappy mistake, by beauty of person, sweetness of temper, vivacity of genius, quickness of conception, and many talents which certainly must alleviate her misfortune.

"She plays at cards with the same readiness as others of the party. She first prepares the packs allotted to her, by pricking them in several parts; yet so imper-

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ceptibly, that the closest inspection can scarce discern her indexes. She sorts the suits, and arranges the cards in their proper sequence, with the same precision, and nearly the same facility, as they who have their sight. All she requires of those who play with her, is to name every card as it is played; and these she retains so exactly, that she frequently performs some notable strokes, such as show a great combination and strong memory.

"The most wonderful circumstance is, that she should have learned to read and write; but even this is readily believed on knowing her method. In writing to her, no ink is used, but the letters are pricked down on the paper; and by the delicacy of her touch, feeling each letter she follows them successively, and reads every word with her finger ends. She herself in writing makes use of a pencil, as she could not know when her pen was dry; her guide on the paper is a small thin ruler and of the breadth of her writing. On finishing a letter, she wets it, so as to fix the traces of her pencil, that they are not obscured or effaced; then proceeds to fold and seal it, and write the direction: all by her own address, and without the assistance of any other person. Her writing is very straight, well cut, and the spelling no less correct. To reach this singular mechanism, the indefatigable cares of her affectionate mother were long employed, who accustomed her daughter to feel letters cut in cards or paste-board, brought her to distinguish an A from a B, and thus the whole alphabet, and afterwards to spell words; then, by the remembrance of the shape of the letters, to delineate them on paper; and lastly, to arrange them so as to form words and sentences.

"She has learned to play on the guitar, and has even contrived a way of pricking down the tunes as an assistance to her memory. So delicate are her organs, that in fingering a tune, though new to her, she is able to name the notes.

"In figured dances she acquits herself extremely well, and in a minuet with inimitable ease and gracefulness. As for the works of her sex, she has a masterly hand; she sews and hems perfectly well; and in all her works she threads the needle for herself however small.

"By the watch her touch never fails telling her exactly the hour and minute."

From this account, however, it would appear, that except reading and writing, the French lady has nothing to boast of in which she is not excelled by Mr Stanley already mentioned, if we may credit all that is reported of him. The works peculiar to her sex are gained mechanically; but the *distinguishing colours*, telling the precise time by a watch, naming the notes in music, and many other things depending upon the ear and touch, are said to be so familiar to him, that his friends cease to think them extraordinary. Attainments still more wonderful are ascribed to him; as, the naming the number of persons in a room on entering it; the directing his voice to each person in particular, even to strangers when they have once spoken; the missing any person absent, and telling who that person is; and, lastly, his being able to form just conceptions of youth, beauty, symmetry, and shape.

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Port-

Blind
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Blindness.

Pore-BLIND, or *Pur-blind*. A person who is very short sighted is said to be *pur-blind*.

Moon-BLIND, denotes horses that lose their sight at certain times of the moon. See FARRIERY.

BLIND-Harry. See *HENRY the Minstrel*.

BLIND-Worm. See *ANGUIS*.

BLINDE, among mineralists, a species of lead-marcasite, by our miners called mock-ore, mock-lead, and wild lead, &c. The German mineralists call it *blende*, whence our denomination *blinde*. It answers to what in Agricola is called *Galena inanis*.

It usually lies immediately over the veins of lead-ore, in the mines which produce it, for it is not found in all. When the miners see this, they know the vein of ore is very near.

BLINDS, or **BLINDES**, in the art of war, a sort of defence commonly made of oziars, or branches interwoven, and laid across between two rows of stakes, about the height of a man, and four or five feet asunder, used particularly at the heads of trenches, when they are extended in front towards the glacis; serving to shelter the workmen, and prevent their being overlooked by the enemy.

BLINDING, a species of corporeal punishment anciently inflicted on thieves, adulterers, perjurers, and others; and from which the ancient Christians were not exempt. Sometimes lime and vinegar, or barely scalding vinegar, was poured into the eyes till their balls were consumed; sometimes a rope was twisted round the head till the eyes started out. In the middle age, they changed total blindness for a great darkness or diminution of sight; which they produced by holding a red-hot iron dish or basin before the eyes till their humours were dried and their coats shrivelled up.

The inhabitants of the city Apollonia executed it on their watch whom they found asleep.—Democritus (according to Plutarch, Cicero, and A. Gellius), put out his own eyes, that he might be less disturbed in his mental contemplations, when thus freed from the distraction of the objects of sight.

BLINDNESS, a privation of the sense of sight, arising from a total deprivation of its organs, or an involuntary obstruction of their functions. See the article **BLIND**.

Total BLINDNESS, is that wherein all sight or perception, even of light, is wanting, as is the case of those who are said to be *stone-blind*. A blind man, by the civil law, cannot make a testament except under certain modifications; but in every case he is disabled from being a witness to a testament, on account of his blindness.

Partial BLINDNESS, is that wherein some faint glimmering is left, as is always the case in people who have ripe cataracts, who are never so blind but they can discern day from night.

Perpetual BLINDNESS, is that which remains alike under all the diversity of seasons, times, ages, &c.

Transient BLINDNESS, is that which gives way of itself in due time, as that of whelps, which continues for several days, sometimes nine, rarely twelve, after they are littered. The Nogais Tartars, according to father Du Ban the Jesuit, who lived among them, are born blind, and open not their eyes till several days.

Periodical BLINDNESS, is that which comes and goes

by turns, according to the season of the moon, time of day, and the like.

Diurnal BLINDNESS, is called also *hemeracopia*.

Nocturnal BLINDNESS, is called also *nyctalopia*, that which ensues on the setting of the sun in persons who see perfectly in the day, but become quite blind as soon as night comes on. Brigg, in Phil. Trans. N^o 159, p. 560, where an instance of it is given. See a singular case of this kind related by Dr Samuel Pye, in the Medic. Observ. and Inquir. Vol. I. p. 111.

The causes of blindness are either ordinary, as a decay of the optic nerve (an instance whereof we have in the Academy of Sciences, where upon opening the eye of a person long blind, the optic nerve was found extremely shrunk and decayed, and having no medulla in it); or some external violence, vicious confirmation, growth of a cataract, *gutta serena*, small-pox, or the like. See *MEDICINE-Index*.

Extraordinary causes of blindness are malignant stench, poisonous juices dropped into the eye, baneful vermin, long confinement in the dark, or the like. The ducks which breed under ground, and break out into the Zirchnitzer sea in Carniola after all great storms, are blind at their first eruption; but in some time come to their sight. The author of the Embassy of D. Garcias de Sylva Figueroa into Persia tells us, that in several parts of the kingdom are found vast numbers of blind people of all ages, sexes, and conditions; by reason of a species of little flies which prick the eyes and lips, and enter the nostrils, carrying certain blindness with them when they light on the eyes.

BLINDNESS, in farriery, is a disease incident to horses, especially those of an iron-grey or dapple-grey colour, when ridden too hard or backed too young. It may be discovered by the walk or step, which in a blind horse is always uncertain and unequal, because he dares not set down his feet boldly when led in one's hand; though if the same horse be mounted by an expert horseman, and the horse of himself be mettled, the fear of the spur will make him go more freely; so that his blindness can hardly be perceived. Another mark whereby a horse may be known to have lost his sight is, that upon hearing any body enter the stable, he will prick up his ears, and move them backwards and forwards, as mistrusting every thing, and being in continual alarm by the least noise. Dr Lower first showed the cause of the ordinary blindness in horses, which is a spongy excrescence, growing in one, sometimes in two, or three places of the *uvea*, which being at length overgrown, covers the pupil when the horse is brought into the light, though in a dark stable it dilates again.

BLINKS, among ancient sportsmen, denoted boughs broken down from trees, and thrown in the way where deer are likely to pass, to hinder their running, or rather to mark which way a deer runs, in order to guide the hunter.

BLINKING OF BEER, in Lincolnshire, signifies letting the wort stand for some time in the vat, till it hath acquired some degree of acidity, in order to dispose it to fine, and be the sooner ready for drinking.

BLISSOM, among husbandmen, corruptly called *blissom*, is the act of a ram when coupling with an ewe.

BLISTER,

Blindness
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Blissom.

Blister
||
Block.

* See the
Index sub-
joined to
Medicine.

BLISTER, in medicine, a thin bladder containing a watery humour, whether occasioned by burns and the like accidents, or by vesicatories applied to different parts of the body for that purpose *.—*Cantharides*, or Spanish flies, applied in the form of a plaster, are chiefly used with this intention. See **CANTHARIDES**.

BLITE, in botany. See **BLITUM**.

BLITH, a town of Nottinghamshire in England, seated in W. Long. 0. 55. N. Lat. 53. 25.

BLITUM, **BLITE**, or *Strawberry Spinach*: A genus of the digynia order, belonging to the monandria class of plants; and in the natural method ranking under the 12th order, *Holeraceæ*. The calyx is trifid; no petals; the seed is one, included in a berry-shaped calyx.

Species. 1. The capitatum, with flowers in clustered heads at the joints and crown of the stalks, is a native of Spain and Portugal, but has been long preserved in the British gardens on account of the beauty of its fruit. It is an annual plant, with leaves somewhat like those of spinach; the stalk rises two feet and an half high; the upper part of the stalk hath flowers coming out in small heads at every joint, and is terminated by a little cluster of the same: after the flowers are past, the heads swell to the size of wood strawberries, and when ripe have the same appearance, but are not eatable; they are full of a purple juice, which stains the hands of those who bruise them of a deep purple colour. 2. The virgatum, with small heads growing from the sides of the stalk, is a native of the south of France and Italy. This seldom grows more than a foot high; the leaves are smaller than the first, but of the same shape: the flowers are produced at the wings of the leaves, almost the length of the stalk; they are smaller, and not so deeply coloured as the first. 3. The tartaricum, triangular, acutely indented leaves, is a native of the country from which it takes its name. Mr Miller received the seeds from Petersburg. It rises to very near three feet high; the flowers come out from the sides of the stalks, but are smaller than those of the first, as is also the fruit.

Culture. All the plants, being annuals, must be propagated by seeds; and as they are very hardy, will succeed in the common borders, if sown in March or April, covering the seed about half an inch deep with earth, and leaving the plants five or six inches asunder. When they come up, each must be supported with a small stick, or they will be borne down by the weight of the berries.

BLOATING, a puffing up or inflation of the exterior habit of the body, lodged chiefly in the adipose cells. It is the same with what physicians call an *emphysema*.

BLOCK is used for a piece of marble as it comes out of the quarry, before it has assumed any form from the hand of a workman.

Block, in the mechanic arts, a large piece of solid wood whereon to fasten work or to fashion it; strength and stability being the requisite properties. In this sense, we say a *chopping block*; a *sugar finer's block*; a *smith's block*, on which his anvil is fastened; an *executioner's block*, on which the criminal's head is laid to be struck off,

Block, among cutters in wood, is a form made of pear-tree, box, or other hard and close-grained wood, free from knots, on which they cut their figures in relief with knives, chissels, &c.

Block, in falconry, denotes the perch whereon a bird of prey is kept. This is to be covered with cloth.

Blocks, in sea-language, are pieces of wood belonging to ships, in which the shivers of pulleys are placed, and wherein the running-ropes go. Of these some are single, some double; and some have three, four, or five, shivers in them. They are named and distinguished by the ropes they carry, and the uses they serve for.

Mounting Block, an eminence usually of stone, cut in steps or notches, serving as a help to mount on horseback. These were much in use among the ancients, who were unacquainted with stirrups. The Romans erected them at proper stations along all their great roads.

Block (Daniel), portrait painter, was born at Stettin in Pomerania in 1580, and gave early proofs of a good genius; which induced his parents to place him as a disciple with Jacob Scherer, a master capable of giving him the best directions, to qualify him for proceeding successfully in his profession. He chiefly painted portraits, in which (according to Sandrart) he was very eminent, and had the honour to paint the portraits of Christian IV. King of Denmark, and of Gustavus Adolphus King of Sweden. The extraordinary merit of this master recommended him to the esteem of the Prince of Mecklenburg, who retained him in his service for 44 years; and by order of that Prince, he painted the portraits of his whole family at full length, as large as life, and in the antique habit; by which works his reputation was established effectually. By the agreeable manner of his colouring, and the easy attitudes of his figures, his paintings became so acceptable to all persons of rank, that before the decline of life, he had acquired a very large fortune; but unfortunately he lost it all, in the compass of a few hours, by the sudden eruption of a plundering party, and with great difficulty his own life was preserved. He died in 1661.

BLOCKADE, in the art of war, the blocking up a place, by posting troops at all the avenues leading to it, to keep supplies of men and provisions from getting into it; and by these means proposing to starve it out, without making any regular attacks.

To *raise a blockade*, is to force the troops that keep the place blocked up from their posts.

BLOCKLAND (Anthony de Montfort), history and portrait painter, was born of a noble family at Montfort in 1532. He learned the art of painting in the school of Francis Floris, whose manner he always followed; and became an artist of great distinction, by endeavouring principally to imitate the taste of the Roman school in design and composition. His genius was best adapted to grand compositions, of which he designed many; some at Delft, but more at Utrecht. His designs had grandeur, the airs of his heads were noble, and the profiles of his female figures approached near to the taste of Parmigiano. Several of his works are in so good a gusto, and particularly a Venus, and

Block
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Blockland.

Bloezil
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Bloemart.

the history of Joseph and his Brethren, that they seem to have been painted by a master educated in the school of Florence. He died in 1583.

BLOCZIL, a fortress of Over-yssel in the United Provinces, seated on the river Aa, at the place where it falls into the Zuider Zee. It has a port sufficient to contain 200 vessels, and serves to defend those ships that cross the sea. It has six good bastions, and several other regular fortifications. E. Long. 6. 0. N. Lat. 52. 44.

BLOEMART (Abraham), painter of landscape, cattle, history, and portrait, was born at Gorcum in 1564, according to Houbraken; but according to Sandrart, whose authority seems to claim the preference, he was born in 1567, and lived mostly at Utrecht. In his youth he applied himself diligently to design after the works of Francis Floris, and afterwards received instructions from several artists of no great repute; but the power of his own genius proved his principal director in the art of painting. He formed a manner peculiar to himself, making nature his model for many of the objects he painted, particularly his cattle, in which he excelled. He died in 1647. He left four sons who were all of them artists; but the most famous was *Cornelius*, the subject of the following article.

BLOEMART (Cornelius), the youngest son of Abraham, was born in 1603 at Utrecht. The first principles of drawing and painting he learned from his father; but his natural inclination for the art of engraving was so powerful, that he applied himself wholly to the pursuit of it. He first studied under Crispin de Pass, an engraver much more famous for the neatness than the good taste of his works. Not satisfied with what he learned from this artist, he went to Rome, in order to perfect himself from the works of the greatest masters: And in that city (where the far greater part of his engravings were made) he died in a very advanced age. "The manner of engraving, adopted by this excellent artist, appears to me (says Mr Strutt) to be not only quite original, but the source from which we may trace that style in which the greatest and best French masters excelled; those I mean who worked with the graver only. He covered the lights upon his distances, and the other parts of his plates which required tinting, with great care. The lights, whether on the distant hills, trees, buildings, or figures, in the engravings prior to his time, had been left quite clear, and by so many white spots scattered in various parts of the same design, the harmony was destroyed, the subject confused, and the principal figures prevented from relieving with any striking effect. By this judicious improvement, Bloemart gave to his prints a more clear and finished appearance, than all the laboured neatness even of Jerom Wierix had been able to produce. He drew correctly; but from his style of engraving, which was executed entirely with the graver, the extremities of his figures are heavy, and his heads are not always equally beautiful or expressive. With respect to the mechanical part of the works, few indeed have excelled him, either in clearness or freedom of execution. His great fault, however, is want of variety. The naked parts of his figures, the draperies, and the back ground, are equally neat, and engraved precisely in the same manner. Hence the effect is flat; and the flesh, for want of sufficient distinction, appears

cold and silvery. His works are justly held in high estimation. They are very numerous, and many of them difficult to be procured."

BLOIS, a town of France, the capital of Blaisois, in Orleanois, is seated on the banks of the river Loire, partly on a plain, and partly on an eminence, in the midst of one of the most agreeable countries of France. The castle is the ornament of this city. At the first view, it seems to be two distinct buildings; but it is joined by a passage cut out of the rock. Joining to this, on the west-side, is the tower of *Chateau Regnaud*, so called because that lordship may be discovered from hence, though 20 miles distant. At the east-end of this is another small tower, which is partly ancient and partly modern. That part of the castle which was built by the duke of Orleans, in the room of that which he demolished in 1632, is a superb edifice, but unfinished. The court, before it, where the church of St Saviour is built, is very large, and was formerly used for tournaments. The most remarkable thing in this castle is a fine long gallery, adorned with many curious and uncommon pieces; it is in the midst of two gardens, one of which is full of fruit-trees, and the other of parterres, fountains, cascades, and marble statues brought from Italy. Beyond these, there is a large park, where there is game in abundance. On all the gates of the city there is the image of the Virgin Mary, who they believe freed them from the plague in 1631. There are several parish churches, chapters, and religious houses for both sexes. The church of St Solenne is the cathedral, and is the handsomest in the city. The front of the Jesuits church is decorated with three orders of architecture, the Doric, Ionic, and Corinthian; but there is only the Doric on the inside. The town-house is a tolerable building, and stands in a street which terminates at the quay, where there is a public walk that has a fine prospect on the Loire, over which there is a bridge that leads to the suburbs of Vienna. There are a few houses on the bridge, and a tower at each end to guard the entrance. About three quarters of a mile from the city, the water runs down the clefts of a rock into a large aqueduct, by which it is conveyed to a reservoir near the walls, and from hence distributed by leaden pipes to the several parts of the city. The country about Blois produces corn, wine, cattle, and game of every kind, and the waters a great quantity of fish. The meadows are so rich and fertile, that the cows yield excellent milk, good in consumptive cases, and which affords the best cream in the kingdom. About a league from Blois, there are mineral springs, which have the same virtues as those of Forges. The trade of Blois is chiefly in wine and brandy; but they also make some serges and stuffs at this place. Several kings have kept their courts at Blois; for which reason they speak the French language in perfection, and the inhabitants are accounted witty and polite. E. Long, 1. 30. N. Lat. 47. 35.

BLOMARY, or BLOOMARY, in metallurgy, the first forge through which iron passes, after it is melted out of the ore.

BLOEMEN (Peter Van), a celebrated painter, born at Antwerp, was brother to John-Francis Van Bloemen, called by the Italians *Orizonti*, and lived for several years at Rome along with his brother. As

soon

Blois
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Bloemen.

Bloemen,
Blond.

soon as he found himself competently skilled in colouring and penciling, as well as in designing, he returned to his native city, where, in the year 1699, he was appointed director of the academy. The composition of this master is rich, and his pictures are generally filled with a number of figures. His subjects are, the marchings of squadrons of cavalry, encampments, artillery, battles, Italian fairs, markets, and festivals; in which he showed great correctness in his design and in his drawing; and an elegance in the manner of dressing his figures; whom he frequently represented in oriental habits. He designed horses in an admirable style; and in his battles gave them abundance of spirit, graceful attitudes, and an expression that was full of life and nature. His landscapes are enriched with elegant architecture, with basso-relievos, and mutilated statues, in a noble taste; and rendered still more pleasing by a good tone of colour, by animals of different kinds, and excellent figures.—His best works are admired in all parts of Europe, and afford large prices: but it is to be observed, that some of his pictures seem rather to be too much laboured or stiff, and (according to the artists phrase) smell of the palette; and those are proportionably less estimable.

BLOEMEN (John-Francis Van.) Vid. ORIZONTI.

BLOEMEN (Norbert Van), brother of the preceding, was a painter of portraits and conversations; but in merit was very inferior to his brothers, although he had a good deal of employment.

BLOND (Christopher le), painter of portraits in miniature and all kinds of subjects on paper, was born in 1670. Very few circumstances relative to his education or life are mentioned by any writers till he was known at Rome in the year 1716, being at that time painter to the Count Martinetz, ambassador at the court of Rome. By the solicitation of Overbeke he was induced to go to Amsterdam, and in that city was employed to paint small portraits for bracelets, rings, and snuff-boxes; of which, although they were painted in water-colours, yet the colouring was as lively and natural as if they had been painted in oil. However, as he found his sight much impaired by the minuteness of his work, he discontinued water-colour painting, and attempted the use of oil with a reasonable degree of success. After he had resided for some years in the Low Countries, he went to England, and set up a new method of printing mezzotinto plates in colours so as to imitate the pictures of which they were copies. In this manner he executed in England several large plates, from pictures of the greatest masters, and disposed of the prints by lottery. But those who obtained the prizes (Mr Strutt says) appear not to have held them in any very great estimation. "The prints (he adds) certainly possess some merit, exclusive of their novelty; but, in general, the colours are flat and dirty; the effect is neither striking nor judiciously managed; and the drawing is frequently very incorrect, especially in the extremities of his figures." Mr Pilkington speaks of them with greater approbation. "The artist (he says) imitated his models with so much skill, such exact resemblance, such correctness of outline, such similarity of colour and expression, that at first they amazed every beholder who viewed them at a proper distance; and many of those prints are still extant, which are much esteemed by persons of good

taste." And Mr Walpole observes, that some heads coloured progressively, according to their several gradations, bear witness to the success and beauty of his invention. He had another merit to the public, with which few inventors begin; for he communicated his secret in a thin quarto, intitled *Coloritto*, or "The harmony of colouring in painting reduced to mechanical practice, under easy precepts and infallible rules." His method was performed by several mezzotinto plates for one piece, each expressing different shades and parts of the piece in different colours. He was not, however, it is said, the original inventor of that manner of managing colours, but took it from Lastman and others, who, with much greater regularity of morals, equal capacities, and more discreet conduct, had before undertaken it without success. Le Blond, whose head was continually full of schemes, next set on foot a project for copying the cartoons of Raphael in tapestry, and made drawings from the pictures for that purpose. Houses were built and looms erected at the Mulberry Ground at Chelsea; but the expences being too great, or the contributions not equal to the first expectations, the scheme was suddenly defeated, and Le Blond disappeared, to the no small dissatisfaction of those who were engaged with him. From hence he went to Paris, where, Basan informs us, he was in the year 1737; and in that city he died, 1740, in an hospital. Le Blond was also author of a treatise, in French, on ideal beauty. It was published in 1732, and has since been translated into English.

BLONDEL (David), a Protestant minister, distinguished by his skill in ecclesiastical and civil history, was born at Chalons sur Marne, and was admitted minister at a synod of the isle of France, in 1614. He wrote, 1. A defence of the reformed churches of France. 2. A work against the decretal epistles. 3. *De Episcopis et Presbyteris*; and other pieces. Bayle informs us that he had a very singular way of studying; he lay on the ground, and had round about him the books which he wanted for the work he was about. He died in 1655, aged 64.

BLONDEL (Francis), regius professor of mathematics and architecture, was employed in several negociations, arrived at the dignity of marshal de camp and counsellor of state, and had the honour of being chosen to teach the dauphin the mathematics; he was also made member of the Academy of Sciences at Paris, and director of the Academy of Architecture. He died at Paris in 1688, aged 68. He wrote, 1. Notes on the architecture of Savot. 2. A course of architecture and mathematics. 3. The art of throwing bombs. 4. A new manner of fortifying places. 5. A comparison between Pinder and Horace; and other works.

BLONDUS (Flavius), an historian born at Forli, in Italy, in 1388, was secretary to Eugenius IV. and other popes. He composed a great many books; and, among others, a History from the year 400 to 1440. He died in 1463.

BLONIEZ, a town of Poland, in the province of Warsovia. E. Long. 20. 35. N. Lat. 52. 0.

BLOOD, a red liquor circulating through the vessels of the human body and the bodies of the larger animals, which appears immediately and essentially necessary to the preservation of life.

Though there is no living creature as yet known whose

Blond
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Blood.

Blood.
1
No animal
without
some liquid
equivalent
to blood.

2
Blood of
different
thickness in
different a-
nimals.

3
That of
bulls anci-
ently used
as a poison.

4
Appearance
of the blood
when
drawn from
a vein.

5
Blood che-
mically a-
nalyfed.

6
Contains
an acid, ac-
cording to
some che-
mists

7
Experi-
ment in
confirma-
tion of this.

whose life doth not immediately depend upon the circulation of some kind of fluid through its vessels, yet unless such fluid is of a red colour, it does not obtain the name of *blood*; and therefore such creatures as have a colourless or milky liquor circulating through their vessels, are called *exsanguious animals*.

The blood has a very different degree of thickness or viscosity in different animals, and even in the same animal at different times. Though it is in all cases endowed with a considerable degree of tenacity, yet in strong animals that tenacity is remarkably greater than in weak ones; and hence the blood of bulls was made use of by the ancients as a poison, its extreme viscosity rendering it totally indigestible by the powers of the human stomach. It is well known also by physicians, that there are some states of the human body in which the blood becomes vastly tenacious, so as in a great measure to refuse any intimate connection with water; and others, in which its crasis is almost totally dissolved, so as to appear, when drawn out of the body, like a fluid and half putrid mass. See *MEDICINE-Index*.

The common appearance of the blood when drawn from a vein in the human body is well known. It first seems an homogeneous red liquor; then it consolidates into one uniform mass; in a little time, a yellowish watery liquor begins to separate from it, which is more or less in quantity according to the state in which the blood happens to be; the red mass, in the mean time, contracts greatly in its dimensions, and increases in solidity. But this increase of solidity is likewise proportional to the state of the blood at the time: in strong people, if attacked with a violent inflammatory disease, the solid part is exceedingly tough, insomuch that Dr Huxham says he has sometimes found it almost like a piece of flesh itself; whereas, in other diseases, the solid part is very soft and tender, breaking in pieces with the slightest touch. The spontaneous separation of the blood into crassamentum, serum, and coagulable lymph, hath been already taken notice of under *ANATOMY*, n^o 126.

The attention of physiologists hath been very much engaged by inquiries into the nature and composition of the blood, and accordingly it hath been examined in all possible ways. By a chemical analysis, it discovers the same principles with other animal substances; giving over in distillation a great quantity of phlegm, a volatile spirit, with much fetid oil; after which, there remains a charred matter, that, burnt in an open fire, leaves a white earth similar to calcined hartshorn. Some eminent chemists, Mr Homberg particularly, have asserted that blood contains an acid as well as an alkali, but that the former doth not arise till towards the end of the distillation: but what is very singular, and indeed must throw no small suspicion on the whole account, is, that the acid and alkali, notwithstanding their great tendency on all other occasions to unite with each other, do here remain separate, so that the liquor may be even redistilled without their forming any neutral compound. An experiment in confirmation of this is recorded in the memoirs of the Royal Academy for 1712. Six pounds of human blood distilled to dryness with a gentle heat, were reduced to a pound and an half; after which, the mass was urged with a graduated fire, till the retort at last became red hot. The produce was 17 ounces of liquor; 12 of which were a red and very empyreuma-

tic, volatile spirit, the other five were oil. The caput mortuum was a light coal weighing four ounces and a half. On rectifying the volatile spirit in a small retort, about an ounce of a red fetid liquor remained, which had a very acid smell, and turned the juice of turnsole red. Mr Homberg now imagined, that the acid contained in the blood of animals could not disengage itself perfectly by these distillations without addition. He therefore determined to distil human blood with an admixture of some other substance; but as earths contain a salt, which might render the operation uncertain, he determined to use only the caput mortuum of a former distillation of the same substance. For this purpose, four pounds of the coagulum of human blood being well mixed with a large quantity of this residuum, and the whole dried in the sun, it was put into a retort, and distilled with a fire raised, towards the end of the operation, to the utmost violence. The oil being separated from the volatile spirit, the latter was rectified; and the consequence was, that there came over four pounds of a red acid liquor, that turned the tincture of turnsole very red. All the distillations of the aqueous liquors already mentioned, obtained by similar processes, being mixed together, and separated from their yet remaining oil, by careful dilution with water and filtration, they were at length distilled together; the liquor that came over was clear as water, and its first quantities contained a great deal of volatile salt, but the last two ounces were found to be as sour as distilled vinegar.—The same products were obtained from the blood of carnivorous animals, as well as from that of animals feeding solely upon vegetables.

In Dr Lewis's notes on Newman's Chemistry we have the following account of the blood, and the parts into which it may be resolved. "Recent blood is equally fluid, and in taste somewhat saline. Viewed by a microscope, it appears composed of numerous red globules swimming in a transparent fluid. On standing for a little time, it separates into a thick crassamentum and fluid serum. By agitation, it continues fluid: A consistent polypous matter adheres to the stirrer, which, by repeated ablution with water, becomes white.—Received from the vein in warm water, it deposits a quantity of transparent filamentous matter, the red portion continuing dissolved in the water. On evaporating the fluid, a red powdery substance is left.—It congeals by frost, and becomes fluid again by warmth; after liquefaction, it quickly putrefies.—Fluid and florid blood exposed to a temperate air, putrefies sooner than such as is more dense. Inspissated to dryness, it leaves a dark-coloured mass, amounting, at a medium, to about one-fourth of the weight of the blood, of a bitter saline taste, easily inflammable, burning with a bluish flame. The exsiccated blood is not soluble in acid or alkaline liquors; but gives some tincture to water and to spirit of wine, and is more powerfully acted upon by dulcified spirit of nitre. Recent blood is coagulated by the mineral acids, and by most of the combinations of them with earthy and metallic bodies. With vegetable acids, and with solutions of neutral salts, it mingles equably without coagulation. Alkalis, both fixed and volatile, render it more fluid, and preserve it from coagulating.

"The serum of blood is more saline than the crassamentum,

Blood.

Dr Lewis's
account of
the blood.

Blood. famentum, and does not so speedily putrefy. It freezes somewhat more difficultly than pure water; and its aqueous part evaporates, by a gentle warmth, somewhat more readily, leaving about one-twelfth of the weight of the serum of a solid yellowish pellucid matter. Exposed to heat a little greater than that of the human body, it coagulates into a solid mass, without any considerable evaporation. Both this coagulum and the inspissated serum are readily inflammable in the fire, not dissoluble in water, or in spirit of wine, in acid or in alkaline liquors."

9
Texture of
the blood,
according
to Lewen-
hoeck.

10
According
to Father
de Torre.

11
According
to Mr
Hewson.

But the texture of the blood discoverable by a microscope, hath engaged the attention of the learned much more than the chemical analysis ever did. Lewenhoeck was the first who discovered, or fancied he discovered, that the blood, as it exists in the body of an animal, consists of a quantity of red globular particles swimming in a large quantity of transparent liquor. Each of these globules, he imagined, was composed of six smaller ones packed together. While the six continued to adhere, their colour was red; but when separated, they became yellow, and thus formed what is called the *serum*. He even pretended to have discovered that each of the serous globules consisted of six smaller ones, and that these when broken down constituted some more subtile and penetrating liquor than the serum, &c. This was for a long time received almost universally as an undoubted fact; and many theories were built upon it, and elaborate calculations made, of which (we hope) no account needs now be given, as the falsity of these pretended discoveries is generally allowed. Father de Torre, with microscopes which he pretended were capable of magnifying to an incredible degree, found that the red particles of the blood were of an annular figure, with a perforation in the middle; and that the ring itself was formed of several joints. Some of these extraordinary magnifiers, however, being sent over to England, those who were appointed by the Royal Society to make trial of them found them totally useless, so that the credit of Father de Torre's discoveries must have rested principally on his own evidence. The falsity of his hypothesis, as well as that of Lewenhoeck, was detected by the late Mr Hewson, whose microscopical experiments on the blood being the latest that have appeared, we shall transcribe the following particular account of them given by himself in a letter to Dr Haygarth physician in Chester. — "The red particles of the blood, improperly called *globules*, are flat in all animals, and of very different sizes in different animals. In man they are small, as flat as a shilling, and appear to have a dark spot in the middle. In order to see them distinctly, I dilute the blood with fresh serum. My predecessors, not having thought of this, could not see them distinctly. And Lewenhoeck in particular, imagining a round figure fittest for motion, concluded they must be round in the human body; though he and others allowed that in frogs, &c. where they viewed them distinctly from the blood being thinner, they were flat. Now I prove that they are flat in all animals. In the human blood, where these particles are small, it is difficult to determine what that black spot is which appears in the centre of each. Some have concluded that it was a perforation: but in a frog, where it is six times as large as in a man, it is easy to show that it

Blood. is not a perforation, but on the contrary is a little solid, which is contained in the middle of a vesicle. Instead, therefore, of calling this part of the blood red *globules*, I should call it red *vesicles*; for each particle is a flat vesicle, with a little solid sphere in its centre.

"I find that the blood of all animals contains vesicles of this sort. In human blood there are millions of them; and they give it the red colour. But on insects they are white, and less numerous in proportion than in man and quadrupeds. As they are flat in all animals, I suspect that shape is a circumstance of importance, but can be altered by a mixture with different fluids. And I find that it is by a determinate quantity of neutral salt contained in the serum, that this fluid is adapted to preserving those vesicles in their flat shape: for if they be mixed with water, they become round, and dissolve perfectly; but add a little of any neutral salt to the water, and they remain in it, without any alteration in their shape, and without dissolving.

"Now, when it is considered, that the blood of all animals is filled with these particles, we must believe that they serve some very important purpose in the animal economy; and since they are so complicated in their structure, it is improbable they should be made by mechanical agitation in the lungs or blood-vessels, as has been suspected, but probably have some organs set apart for their formation. This I shall endeavour to prove, when I have explained their structure a little more particularly, and mentioned the manner in which I exhibit it. I take the blood of a toad or frog, in which they are very large; I mix it with the serum of human blood to dilute it; I find them appear all flat; so they do in the blood-vessels of this animal, as I have distinctly seen in the web between its toes, whilst the animal was alive and fixed in the microscope. Their appearance in these animals is not unlike slices of cucumber. I next mix a little of the blood with water, which immediately makes them all round, and then begins to dissolve them whilst they are round. I incline the stage of the microscope, so as to make them roll down it; and then I can distinctly see the solid in the middle fall from side to side like a pea in a bladder. A neutral salt added to them at this time brings them back to their flat shape: but if the salt be not added, the water gradually dissolves away the vesicle; and then the little sphere is left naked. Such is the composition of these particles. I have exhibited these experiments to a considerable number of my acquaintance, who all agree in their being satisfactory.

"The microscope I use is a single lens, and therefore as little likely to deceive us as a pair of spectacles, which, as is allowed by all who use them, do not disfigure objects, but only represent them larger.

"From farther experiments, I am convinced, that the use of the thymus and lymphatic glands is to make the middle solid pieces: and I can prove it in as satisfactory a manner as you can do the use of any viscus in the human body; that is, by opening these glands, and examining the fluid contained in their cells, which I find to be full of these little solids. I moreover find, that the lymphatic vessels take them up from those glands, and convey them into the blood-vessels which carry them to the spleen, in whose cells they have the

Blood.

vesicles laid over them; so that the thymus and lymphatic glands make the central particles, and the spleen makes the vesicles that surround them. That this is the use of the spleen appears from examining the lymph which is returned from its lymphatic vessels; for that lymph, contrary to what is observed in other parts of the body, is extremely red.

"But besides having these glands set apart for making the red vesicles of the blood, I find that they are also made in the lymphatic vessels in different parts of the body, whose coats have blood-vessels properly constructed for this secretion. So that the thymus and lymphatic glands are no more than appendages of the lymphatic system, for making the middle particles; and the spleen an appendage to the lymphatic vessels, for making the vesicles which contain these middle particles.

"I conjecture that it is the coagulable lymph which is converted into this red part of the blood, from a curious fact that has long been known; namely, that the blood in the splenic vein does not coagulate when exposed to the air, as the blood of other veins does; so that it seems to be robbed of its coagulable lymph in passing through the spleen.

"It is very remarkable, that the spleen can be cut out of an animal, and the animal do well without it. I made the experiment on a dog, and kept him a year and a half without observing his health to be in the least impaired. From this some have concluded the spleen to be an useless weight; which is absurd, when we consider that all animals with red blood have it. Therefore it is more consistent with what we know of the animal œconomy, to conclude, that since an animal can do well without it, there is probably some part of the body that can supply its place.

"Insects have vesicles constructed in a similar way to ours, but differing in colour. But insects have neither spleen, thymus, nor lymphatic glands; and therefore in them probably these vesicles are entirely fabricated in the lymphatic vessels. But to us, and other of the more perfect animals, besides the lymphatic vessels, nature has given those glands, that a proper quantity of those important vesicles might be the better secured to us; just as she has given us two ears, the better to secure us hearing through life, though we can hear perfectly well with one."

12
Objection
to his hypo-
thesis.

This letter, we apprehend, contains the strength of Mr Hewson's evidence for his hypothesis; on which we shall only remark, that if the red globules are prepared in the manner above mentioned, and the lymphatic vessels are excretories of those glands where the red particles are formed; then if there is any vessel where all these excretories unite, as mentioned ANATOMY, n° 106, in that vessel the lymph ought to appear very red, on account of the accumulated quantity of red globules brought thither from all parts of the body. But no such redness seems ever to have been taken notice of by any anatomist: this therefore must be an objection to Mr Hewson's hypothesis; and such an one, perhaps, as will not be easily removed.

13
Opinion of
Dr Wilson.

Many other hypotheses have been invented concerning the formation of the red blood, and various opinions delivered concerning its red colour. In a lecture delivered at Newcastle in 1773, by Dr Wilson of that

place, he asserts "that it is self-evidently the office of the veins to elaborate the fluids into that form and composition which we know by the name of *red blood*."

The self-evidence here, however, is by no means apparent to us; nor doth he at all point it out in an intelligible manner.—Dr Cullen, in his philosophical part of The Institutions of Medicine, acknowledges that

14
Of Dr Cul-
len.

we know but little of the formation of any of the animal fluids; and concerning the microscopical observations, &c. on the blood, gives his opinion in the following words, § ccliv. "The red globules have been considered as an oily matter, and from thence their distinct and globular appearance has been accounted for: but there is no direct proof of their oily nature; and their ready union with, and diffusibility in, water, renders it very improbable. As being microscopical objects only, they have been represented by different persons very differently. Some have thought them spherical bodies, but divisible into six parts, each of which in their separate state were also spherical; but other persons have not observed them to be thus divisible. To many observers they have appeared as perfectly spherical; while others judge them to be oblate spheroids, or lenticular. To some they have appeared as annular, and to others as containing a hollow vesicle. All this, with several other circumstances relating to them, very variously represented, show some uncertainty in microscopical observations; and it leaves me, who am not conversant in such observations, altogether uncertain with respect to the precise nature of this part of the blood. The chemical history of it is equally precarious; and therefore what has been hitherto said of the production and changes happening to these red globules, we chuse to leave untouched.—We suppose that the red globules, when viewed singly, have very little colour; and that it is only when a certain number of them are laid upon one another, that the colour appears of a bright red: but this also hath its limits; so that when the number of globules laid on one another is considerable, the colour becomes of a darker red. Upon this supposition, the colour of the mass of blood will be brighter or darker as the colouring part is more or less diffused among the other parts of the mass; and we think this appears to be truly the case from every circumstance that attends the changes which have been at any time observed in the colour of the blood."

13
He ac-
counts for
the colour
of the
blood from
the number
of red par-
ticles con-
tained in it.

Concerning the uncertainty of microscopical, as well as chemical experiments, we shall not dispute; though the conclusion against them seems carried too far. But with regard to the colour of the blood, we apprehend it hath been known, almost, if not altogether, since the discovery of the circulation, that the florid or dark colour depends on the presence or absence of air, and not upon any number of globules.—Thus the blood returning from the veins is of a dark colour. Though diluted with the fresh chyle from the subclavian vein, it continues of the same dark colour till it passes thro' the lungs, upon which it instantly assumes a very florid red; but it can never be proved that the globules in the pulmonary vein are at all less numerous than in the pulmonary artery.—That this change of colour may be effected by the air through membranes much thicker than we can suppose the vessels of the lungs to be, hath been demonstrated by Dr Priestley's experiments men-

16
Colour of
the blood
accounted
for from
the action
of the air.

tioned

Blood.

tioned under the article *DEPHLOGISTICATED Air*; but whether the change is occasioned by the mere separation of phlogiston from the blood, or by the absorption of some other principle in its stead, is not yet determined, though the latter is indeed acknowledged by Dr Priestley himself to be the more probable opinion. He even supposes the redness to be owing to a portion of dephlogisticated air absorbed in the lungs; but under the above article it is shown that this fluid cannot be absorbed by any liquid without decomposition. It must therefore be the elastic principle of this air which is absorbed, while the other combined with part of the phlogiston emitted by the blood is converted into fixed air.

17
Uses of the
blood in a-
nimals.

18
The vital
principle
thought by
some to re-
side in the
blood.

19
Mr Hun-
ter's argu-
ments in
favour of
this opi-
nion.

This leads us to consider the uses to which the blood is subservient in the animal œconomy, and the changes that happen to it in respiration. The uses of this fluid are so various, and of such an important nature, that some have not scrupled to affirm the blood to be actually possessed of a living principle, and that the life of the whole body is derived from it. This opinion was first broached by the celebrated Harvey, the discoverer of the circulation: but in this he was never much followed; and the hypothesis itself, indeed, has been pretty much laid aside and neglected, till of late that it was revived by Mr J. Hunter, professor of anatomy in London. This gentleman supports his opinion by the following arguments: 1. The blood unites living parts, in some circumstances, as certainly as the yet recent juices of the branch of one tree unite it with that of another. Were either of these fluids to be considered as extraneous or dead matters, he thinks they would act as stimuli, and no union would take place in the animal or vegetable kingdom. This argument, Mr Hunter imagines, is still farther established by the following experiment. Having taken off the testicle from a living cock, he introduced it into the belly of a living hen. Many weeks afterwards, upon injecting the liver of the hen, he injected the testicle of the cock; which had come in contact with the liver, and adhered to it. He alleges, that in the nature of things, there is not a more intimate connection between life and a solid, than between life and a fluid. For although we are more accustomed to connect it with the one than the other, yet the only real difference which can be shown between a solid and a fluid is, that the particles of the one are less moveable among themselves than those of the other. Besides, we often see the same body fluid in one case and solid in another. 2. The blood becomes vascular like other living parts. Mr Hunter affirms, that, after amputations, the coagula in the extremities of arteries may be injected by injecting these arteries; and he has a preparation in which he thinks he can demonstrate vessels rising from the centre of what had been a coagulum of blood, and opening into the stream of the circulating blood. 3. Blood taken from the arm in the most intense cold which the human body can bear, raises the thermometer to the same height as blood taken in the most sultry heat. This he considers as a strong proof of the blood's being alive; as living bodies alone have the power of resisting great degrees both of heat and cold, and of maintaining in almost every situation, while in health, that temperature which we distinguish by the name of *animal heat*.

4. Blood is capable of being acted upon by a stimulus. In proof of this, he observes, that it coagulates from ex-

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posure, as certainly as the cavities of the abdomen and thorax inflame from the same cause. The more it is alive, that is, the more the animal is in health, it coagulates the sooner on exposure; and the more it has lost of its living principle, as in the case of violent inflammations, the less is it sensible to the stimulus produced from its being exposed, and it coagulates the later. 5. The blood preserves life in different parts of the body. When the nerves going to a part are tied or cut, the part becomes paralytic, and loses all power of motion; but it does not mortify. If the artery be cut, the part dies, and mortification ensues. What keeps it alive in the first case? Mr Hunter believes it is the living principle which alone can keep it alive; and he thinks that this phenomenon is inexplicable on any other supposition, than that life is supported by the blood. 6. Another argument he draws from a case of a fractured os humeri he had occasion to observe. A man was brought into St George's hospital for a simple fracture of the os humeri, and died about a month after the accident. As the bones had not united, Mr Hunter injected the arm after death. He found that the cavity between the extremities of the bones was filled up with blood which had coagulated. This blood was become vascular. In some places it was very much so. He does not maintain that all coagulated blood becomes vascular: and indeed the reason is obvious; for it is often thrown out and coagulated in parts where its becoming vascular could answer no end in the system: as, for example, in the cavities of aneurismal sacs. If it be supposed, that, in such cases as that just now mentioned, the vessels are not formed in the coagulum, but come from the neighbouring arteries, he thinks it equally an argument that the blood is alive; for the substance into which vessels shoot must be so. The very idea, that such a quantity of dead matter as the whole mass of blood, circulates in a living body, appears to him absurd.

The system which at present stands opposed to that of Mr Hunter, considers the brain and nervous system as the fountain of life; and that, so far from receiving its life from the blood, the nervous system is capable of instantaneously changing the crisis of the blood, or any other animal fluid; and though the nervous system cannot continue its actions for any length of time if the action of the blood-vessels is suspended, yet the heart and blood-vessels cannot act for a single moment without the influence of the nervous fluid. Hence, say they, it is plain we must suppose the nervous system, and not the blood, to contain properly the life of the animal, and consequently to be the principal vital organ. The secretion of the vital fluid from the blood by means of the brain, is, by the supporters of this hypothesis, denied. They say, that any fluid secreted from the blood must be aqueous, inelastic, and inactive; whereas the nervous fluid is full of vigour, elastic, and volatile in the highest degree. The great necessity for the circulation of the blood through all parts of the body, notwithstanding the presence of the nervous fluid in the same parts, they say is, because some degree of tension is necessary to be given to the fibres, in order to fit them for the influx of the nervous fluid; and this tension they receive from the repletion of the blood-vessels, which are every where dispersed along with the nerves.

To follow this dispute through every argument that hath been, or that may be, used by both parties, would

R r

prove

Blood.

Blood.

21
Decisive arguments in favour of Mr Hunter's opinion.

prove tedious, and to us appears in a great measure unnecessary, as the following short considerations seem to decide the matter absolutely against the patrons of the nervous system. In the first place, then, if we can prove the life of the human body to have existed in, or to have been communicated from a fluid to the nervous system, the analogical argument will be very strongly in favour of the supposition that the case is so still. Now, that the case once was so, is most evident; for the human body, as well as the body of every other living creature, in its first state, is well known to be a gelatinous mass, without muscles, nerves, or blood-vessels. Nevertheless, this gelatinous matter, even at that time, contained the nervous fluid. Of this there can be no doubt, because the nerves were formed out of it, and had their power originally from it; and what is remarkable, the brain is observed to be that part of the animal which is first formed. Of this gelatinous fluid we can give no other account, than that it was the nutritious matter from which the whole body appears to be formed. At the original formation of man, and other animals, therefore, the nutritious matter was the substratum of the whole body, consisting of muscles, nerves, blood-vessels, &c. nay more, it was the immediate efficient cause of the nervous power itself. Why should it not be so now as well as then? Again, in the formation of the embryo, we see a vital principle existing as it were at large, and forming to itself a kind of regulator to its own motions, or a habitation in which it chooses to reside, rather than to act at random in the fluid. This habitation, or regulator, was undoubtedly the nervous system, and continues so to this moment; but at the same time, it is no less evident that a nutritious fluid was the immediate origin of these same nerves, and of that very nervous fluid. Now we know, that the fluid which in the womb nourishes the bodies of all embryo animals, is necessarily equivalent to the blood which nourishes the bodies of adult ones; and consequently, as soon as the blood became the only nutritious juice of the body, at that same time the vital or nervous fluid took up its residence there, and from the blood diffused itself along the nerves, where it was regulated exactly according to the model originally formed in the embryo. Perhaps it may be said, that the vital power, when once it hath taken possession of the human or any other body, requires no addition or supply, but continues there in the same quantity from first to last. If we suppose the nervous power to be immaterial, this will indeed be the case, and there is an end of reasoning upon the subject; but if we call this power a volatile and elastic fluid, it is plain that there will be more occasion for recruits to such a power than to any other fluid of the body, as its volatility and elasticity will promote its escape in great quantities through every part of the body. It may also be objected, that it is absurd to suppose any fluid, or mechanical cause, capable of putting matter in such a form as to direct its own motions in a particular way: but even of this we have a positive proof in the case of the electric fluid. For if any quantity of this matter has a tendency to go from one place to another where it meets with difficulty, thro' the air for instance, it will throw small conducting substances before it, in order to facilitate its progress. Also, if a number of small and light conducting substances are laid between two metallic bo-

dies, so as to form a circle, for example; a shock of electricity will destroy that circle, and place the small conducting substances nearer to a straight line between the two metals, as if the fluid knew there was a shorter passage, and resolved to take that, if it should have occasion to return*. Lastly, it is universally allowed, that the brain is a secretory organ, made up of an infinite number of small glands, which have no other excretories than the medullary fibres and nerves. As a considerable quantity of blood is carried to the brain, and the minute arteries end in these small glands, it follows, that the fluid, whatever it is, must come from the blood. Now, there is no gland whatever, in the human, or any other body, but will discharge the fluid it is appointed to secrete, in very considerable quantity, if its excretory is cut. Upon the cutting of a nerve, therefore, the fluid secreted by the brain ought to be discharged; but no such discharge is visible. A small quantity of glairy matter is indeed discharged from the large nerves; but this can be no other than the nutritious juice necessary for their support. This makes it plain, even to demonstration, that the fluid secreted in the brain is *invisible* in its nature; and as we know the nervous fluid hath its residence in the brain, it is very probable, to use no stronger expression, that it is the peculiar province of the brain to secrete this fluid from the blood, and consequently that the blood originally contains the vital principle.

After it is allowed that the blood contains the vital principle, it becomes another question not very easily solved, Whence is this vital principle derived?—For this we can only discover two sources; namely, the chyle or aliment from which the blood is prepared, and respiration. The latter hath been commonly held as the principal source of the vital principle; and, for a long time, it was generally thought that there was a kind of vivifying spirit in the air, which being absorbed by the blood at each inspiration, communicated to that fluid the quality necessary for preserving animal life. As a proof of this it was urged, that life cannot be supported without respiration, and that air which hath been often breathed ceases to be capable of supporting life; because when once it has been totally deprived of its vivifying spirit, it can communicate none to the blood in any subsequent respirations.—This doctrine, however, hath been denied, and generally thought to be exploded by modern discoveries. Dr Hales brings several experiments against it; of which the following may serve for a specimen, and which we shall give in his own words.

“ I tied a middle-sized dog alive on a table, and, having laid bare his wind-pipe, I cut it asunder just below the larynx, and fixed fast to it the small end of a common fosslet: the other end of the fosslet had a large bladder tied to it, which contained 162 cubic inches; and to the other end of the bladder was tied the great end of another fosslet whose orifice was covered with a valve which opened inwards, so as to admit any air that was blown into the bladder, but none could return that way; yet, for further security, that passage was also stopped by a spigot.

“ As soon as the first fosslet was tied fast to the wind-pipe, the bladder was blown full of air through the other fosslet; when the dog had breathed the air in the bladder to and fro for a minute or two, he then breathed

very

Blood.

* See Electricity.

22

Vivifying spirit supposed to be derived from the air.

23

This doctrine for some time generally denied.

24

Dr Hales's experiment against a vivifying spirit. *Statistical Essays*, Vol. I. p. 255.

Blood. very fast, and showed great uneasiness, as being almost suffocated.

"Then with my hand I pressed the bladder hard, so as to drive the air into his lungs with some force; and thereby make his abdomen rise by the pressure of the diaphragm, as in natural breathings; then taking alternately my hand off the bladder, the lungs with the abdomen subsided: I continued in this manner to make the dog breathe for an hour; during which time, I was obliged to blow fresh air into the bladder every five minutes, three parts in four of that air being either absorbed by the vapours in the lungs, or escaping through the ligatures upon my pressing hard on the bladder.

"During this hour, the dog was frequently near expiring, whenever I pressed the air but weakly into his lungs; as I found by his pulse, which was very plain to be felt in the great crural artery near the groin, which place an assistant held his finger on most part of the time: but the languid pulse was accelerated so as to beat fast, soon after I dilated the lungs much by pressing hard upon the bladder; especially when the motion of the lungs was promoted by pressing alternately the abdomen and the bladder, whereby both the contraction and dilatation of the lungs was increased.

"And I could by this means rouse the languid pulse whenever I pleased, not only at the end of every five minutes, when more air was blown into the bladder from a man's lungs, but also towards the end of the five minutes, when the air was fullest of fumes.

"At the end of the hour, I intended to try whether I could have by the same means kept the dog alive some time longer, when the bladder was filled with the fumes of burning brimstone; but being obliged to cease for a little time from pressing the air into his lungs, while matters were preparing for this additional experiment, in the mean time the dog died, which might otherwise have lived longer if I had continued to force the air into the lungs.

"Now, though this experiment was so frequently disturbed, by being obliged to blow more air into the bladder 12 times during the hour; yet since he was almost suffocated in less than two minutes, by breathing of himself to and fro the first air in the bladder, he would have died in less than two minutes when one fourth of the old air remained in the bladder immediately to taint the new air admitted from a man's lungs; so that his continuing to live through the whole hour, must be owing to the forcible dilatation of the lungs by compressing the bladder, and not to the vivifying spirit of the air."

²⁵
Dr Priest-
ley's opi-
nion.

Dr Priestley at first concluded from his own observations, and no doubt very justly, that air which hath been often breathed becomes pernicious by its accumulated phlogiston, stimulating the lungs, and making the animal fall into convulsions. Respiration, therefore, he supposed to be a phlogistic process, in which the blood parts with its superfluous phlogiston. He did not say, that the blood receives nothing in exchange; but rather that it may receive some nitrous principle, which gives it the red colour; but as to a vivifying spirit, he doth not appear to have the least idea of any such thing being received at that time. Nay, in his first volume, p. 277. he expressly adopts the other hypothesis, namely, that the vital principle is received from the chyle. "My conjecture (says he)

is, that animals have a power of converting phlogiston, from the state in which they receive it in their nutriment, into that state in which it is called the *electrical fluid*; that the brain, besides its other proper uses, is the great laboratory and repository for this purpose; that by means of the nerves this great principle, thus exalted, is directed into the muscles, and forces them to act in the same manner as they are forced into action when the electric fluid is thrown into them *ab extra*."

These theories were opposed in the former edition of this work. With regard to Dr Hales's opinion, that the want of elasticity, or pressure, is the reason why phlogisticated air cannot support animal life, we apprehended it to be totally inconclusive, because it doth not at all appear that phlogisticated air wants elasticity; on the contrary, from Dr Priestley's experiments it appears to be more elastic than common air. Besides, we know that the elasticity of every fluid must always be in proportion to the pressure upon it, as reaction is always equal to action. Supposing therefore the elasticity of any portion of air to be destroyed, the pressure of the superincumbent atmosphere will reduce it into a proportionably less bulk, and then it is equally elastic with the rest; for if it was not, it would behave it still to yield under the pressure. Hence we may see, that as the bladder made use of in Dr Hales's experiment was by no means sufficient to keep off the pressure of the external atmosphere, the death of the dog could not be fairly ascribed to want of elasticity in the tainted air. When he applied more force than the natural elasticity of the air, he kept the dog *alive*, as he calls it, for an hour; but we can by no means allow a mechanical circulation of the blood to be life, any more than we can allow a dead body to be alive on account of the motion of its arm or any other member by mechanical means. The experiment, however, is valuable, because it shows that respiration is one of the immediate mechanical agents by which the circulation of the blood is carried on; but in order to prove that the dog was really kept alive by this means, he ought to have recovered from the effects of the experiment. Had Dr Hales tried a similar experiment on himself, by taking the fosses in his mouth, closing his nostrils, and causing another person compress the bladder, we have not the least doubt that he would then have felt such a method of breathing not to be a way of preserving life, but of destroying it.

As to Dr Priestley's conclusions, it was argued, that "though he found air diminished by admitting phlogiston to it, Dr Priestley finds the mere accession of any material substance can never diminish, but must increase, its bulk. The diminution, therefore, on the accession of phlogiston, is an evident proof that some part of the air is actually taken away. That the phlogiston received is not incorporated with the air is likewise evident, as well as that it takes up space in the tainted air, because, by agitation in water, the phlogistic matter separates from the air, and enters into the water. The consequence of this is, that the air is still farther diminished in bulk; and what remains is pure air, fit for supporting animal life, and of being farther diminished by phlogiston as before. It appears also certain, that phlogiston is not endowed with any inherent power by which it can expand itself; otherwise it would fly off *in vacuo*, which it never is known to do. Another circumstance

Blood.

²⁶
Dr Hales's
experiment
inconclu-
sive.

²⁷
Cause of
the diminu-
tion of air
by phlogi-
stion, &c.

Blood.

we must also attend to is, that the action of phlogiston seems to be entirely confined to a particular part of the atmosphere; namely, that which is now so well known by the name of *fixed air*. This it entirely deprives of its elastic principle, so that it is actually no longer air, but becomes a solid substance, making a part, and that no inconsiderable one, of innumerable terrestrial substances, as chalk, lime-stone, &c."

That the justness of the conclusion about to be drawn from Dr Priestley's experiments may be more apparent, the phenomena were summed up in the two following propositions. "1. Phlogiston cannot act by itself without the assistance of air. 2. The emission of phlogiston is attended with the total destruction of the elasticity of a certain quantity of fixed air, which then ceases to be fluid. Hence we affirm, that it is not the phlogistic substance which acts upon the air, but the elastic principle in the fixed air contained in the common atmosphere that acts on the phlogistic substance. This elastic principle, entering the phlogistic body, displaces a quantity of phlogiston equivalent to its own quantity, and takes its place; and hence proceeds the first diminution of the air, not from an accession of phlogiston, but from an escape of the elastic principle belonging to fixed air. The phlogiston and fixed particles of the air now hang loose like smoke or vapour, and are ready to be attracted by any thing capable of imbibing them; and hence proceeds the second diminution by agitation in water."

28
Why a
phlogistic
substance
parts with
its phlogi-
ston.

29.
Proof of a
reception of
the vivify-
ing princi-
ple from
the air.

"Now to apply this reasoning to the point in question: The blood is found to emit phlogiston from the lungs at every expiration; therefore we affirm it hath received a proportional quantity of elastic vapour which it had not before. Again: The air expelled from the lungs is found to contain much of the fixable part floating loose, and capable of being attracted by lime-water, &c.; therefore we say, this elastic principle hath come from that part of the atmosphere. But, to put the matter beyond doubt, the very inspection of arterial and venous blood will show, that the first hath a quantity of elastic matter in it which the last wants: and as the brain as well as all other parts of the body are supplied with arterial blood, we think it abundantly evident, that this elastic principle is absolutely and essentially necessary to life; that it is continually expended thereon; and that it may be said with the utmost propriety, that every time we draw the air into our lungs, we receive a portion of vivifying or vital spirit from it into our blood. Add to all this, that many substances which are commonly observed to phlogistificate air, appear to receive an elastic spirit by so doing. Putrefying bodies swell: they would not do so *in vacuo*; and therefore we must conclude, that they receive this elastic principle which swells them from the external air, and experience shows that it is communicated by this fixable part of the atmosphere."

"The foregoing reasoning, which to us appeared sufficiently conclusive, leads to a very important discovery in natural philosophy, viz. That it is to the atmosphere, and to that particular part of it which goes by the name of *fixed air*, that we are every moment indebted for that vital spirit which animates our bodies, and is the immediate bond of union betwixt our immaterial spirit and this visible world. It may be asked indeed, If fixed air is capable of supplying this spirit in

30
Objection
answered.

such plenty, how comes it to be so instantaneously fatal when breathed? The reply to this, however, is obvious: it communicates too great a degree of elasticity to the blood; whence the circulation is stopped, and instant death ensues. That this is really the case, appears from the following account of the symptoms observed on the dissection of persons who have been suffocated by this kind of air.

"1. The vessels of the brain are gorged with blood, and the ventricles of that viscus are filled sometimes with a frothy, sometimes with a bloody, serosity. 2. The trunk of the pulmonary artery is much distended, and the lungs appear nearly in a natural state. 3. The right ventricle and auricle of the heart, the venæ cavæ, and jugular veins, are full of frothy blood. 4. Bloody serosity is often found in the bronchiæ. 5. The trunk of the pulmonary veins, and the left auricle, are either empty, or almost empty, of blood. 6. The blood found in the places that have been mentioned, is generally fluid, and as it were in a dissolved state. It is easily extravasated into the cellular texture, of the head particularly, because it is in this part that it abounds most. 7. The epiglottis in suffocated persons is raised, and the glottis open and free. 8. The tongue is much swelled, and can hardly be contained within the mouth. 9. The eyes protrude, and preserve their lustre to the second or third day. They are often even brighter than natural. 10. The body preserves its heat for a long time. Nay the heat is sometimes greater than it is during life, or at least consistently with health. 11. The limbs are flexible for a long time after death. 12. The face is more swelled, and often more red than usual. 13. The neck and upper extremities are sometimes so much swelled, that they appear to be inflamed. These swellings, however, do not, like œdematous ones, preserve the impressions of the finger."

"This account seemed so much in favour of what we had already advanced concerning the action of fixed air, that no observation was made upon it farther than that this elastic principle would seem also to be the cause of animal-heat; for as the blood evidently received a vast quantity of elastic fluid, it also received a much greater proportion of heat than usual."

Such was the mode of reasoning adopted at that time, derived from the discoveries which had been made in *Aerology*. Succeeding discoveries, however, have made it evident, that fixed air is not one of the natural component parts of our atmosphere, but that it consists of two different fluids; one of which is commonly called *phlogisticated*, the other *dephlogisticated*, air. It is the latter which supplies the vital principle; and the above reasoning still holds good, only substituting the words *dephlogisticated air* for *fixed air*. The poisonous quality of the latter seems also still to depend on its too easy decomposition; by which means the elastic principle is discharged into the blood in such quantity as to burst the small vessels, as has already been observed. This is shown indeed by the remedies most proper for the recovery of those who have suffered from the noxious qualities of fixed air. These consist in evacuation, and especially sprinkling the body with cold water, in order to take off the superfluous heat, and produce an universal contraction of the vessels.

It now remains only to give some account of the means by which the circulation of the blood is carried on

Blood.

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Medical
Comment.
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p. 256.

31
Appear-
ances on the
dissection of
those suffo-
cated by fix-
ed air.

32
Fixed air
supposed
the cause
of animal
heat.

33
This theory
corrected.

³⁴ **Blood.** on in the living body. From the time of Harvey till very lately, this was supposed to be chiefly the muscular power of the heart and arteries, which by some physiologists have been thought to be prodigiously great; and accordingly many calculations, requiring no small degree of mathematical knowledge to understand them, have been made of the forces requisite to perform this circulation. Other physiologists, however, have thought proper to take in several auxiliary helps, as the motion of the muscles, respiration, &c. and from Dr Hales's experiment abovementioned it appears that respiration hath a considerable influence in this matter. It cannot, however, be the sole cause, seeing the circulation is carried on in animals which do not respire.—In 1773, Dr Wilson, in the lecture already quoted, suggested a new principle of motion, which we believe was never used before to account for the circulation of animal fluids. It is shortly this: "As the fluids of the human body do all of them suffer a continual waste, and consequently require a constant supply in proportion, we must look upon their going out of the body to be the end of their motion, and on their entering into the body to be the beginning of it; and hence we are to look for the origin of all the motion of the fluids in that part of the system where the new supplies are taken in. This is the *primæ viæ*, where the lacteals absorb a fluid from the digested aliment, and convey it into the blood. The power by which this is accomplished, is necessarily independent of the heart, as having not the least connection with it. It has been said to be the same with that which causes fluids rise in capillary tubes; but though very probably the powers in both cases may be the same, there is this remarkable difference between them, that in the capillary tubes the fluids only rise to a certain height, and will not rise at all unless the tubes are empty. In the lacteals they rise in vessels already full, and continue to do so. Neither is the force whereby this absorption is performed to be accounted little; seeing the supply by the chyle must constantly be equal to the waste which is continually taking place in the fluids already contained in the vessels. We see also, with what force an absorption of this kind sometimes takes place in other cases; thus ropes will absorb water with such strength as to raise immense weights fastened to them, and which no mechanical injection of water into small tubes could possibly accomplish. What is already said of the lacteals applies also to the lymphatics; and from thence we are almost tempted to conclude, that the case is the same with the sanguiferous veins also; that though there may be a continuation of some arteries into the veins corresponding with them, yet that for the most part these vessels extravasate the blood into small cavities, which is then taken up by the absorbent power of the veins, and returned to the heart.

"If, however, the vessels continued absolutely full, it would be impossible that any motion could be carried on in them; and to continue and regulate the circulation, the heart with its cavities is provided. Let us suppose, that by the abovementioned power the veins are all full, and the auricles or chambers into which the veins empty themselves are full also; where is the collected stream in the veins to go next? There is no room for more in the auricle. What must be done? The auricle contracts and empties itself. The conse-

quence is a sudden vacuum equal to what the auricle could contain; the turgid veins, urged by the absorbing power abovementioned, rush their contents into the auricle to fill up the vacuum again, and all behind moving in the venous direction advances forward with so much force, that the veins near the heart sustain a pulsation from the regurgitation of this impetuous stream, when the auricle shuts upon it to empty itself. In short, the full auricle occupies a determinate quantity of space in the breast: when it is emptied, there is a nonresisting vacuum of so much space as was full before, and thither there is a mechanical nifus from the remotest filament of a vein over the whole body, which becomes conspicuous in the torrent that rushes every other moment from the mouth of the vena cava into this vacuum."

This is a short abstract of Dr Wilson's new theory of the circulation. According to him, this absorbing power of the veins is the principle agent, while the heart and arteries do no more than empty themselves of the blood with which they are filled by the veins. Even this cause, however, he says, would not be sufficient to carry on the circulation for a single moment, without the presence of another which he calls *life*, and does not consider as absolutely unmechanical, tho' we cannot reduce it either to mechanical rules or ideas. But as we apprehend all speculations concerning such causes must be arbitrary and without foundation, we forbear to give any account of the Doctor's opinions on this subject.

It hath been a general opinion, that blood, as it exists in the bodies of animals, contains a considerable quantity of common air; and indeed it is certain, that blood, after it has been drawn from the veins of any animal, and afterwards placed under the receiver of an air-pump, yields a very considerable quantity of air upon exhausting the receiver: but if a portion of any blood-vessel is tied up so as to prevent the escape of its contents, and then cut out of the body and placed under a receiver, it will not swell, or show the least sign of its containing any quantity of air whatever.

Blood was formerly held in great esteem as a medicine for some particular diseases. Baths of the blood of infants have been recommended as an infallible remedy for the elephantiasis, &c.; and the blood of goats and some other animals was used by the Galenists, and is recommended even by Dr Mead in pleurifies: but the first abominable medicine, as well as the other, is now deservedly exploded. The principal use of blood in the arts is for making Prussian blue, or sometimes for clarifying certain liquors; it is also recommended in agriculture as an excellent manure for fruit-trees. A mixture of blood with lime makes an exceedingly strong cement; and hence it is of use in the preparation of some chemical lutes, the making floors*, &c.—As a food, it hath been disputed whether blood really affords any nourishment or not. The best judges now, however, are generally agreed that it is very nutritious; and tho' out of the body, like the white of an egg, it is very insoluble, yet, like that too, in the body it is commonly of easy digestion. It is, however, highly alcalescent in hot climates; on which account the prohibition of it to the Israelites was very proper. Even in this country, when blood was used as food in great quantity, the scurvy was more frequent than at other times; but;

³⁴ Circulation of the blood how carried on.

³⁵ New hypothesis by Dr Wilson.

Blood.

³⁶ Blood contains no air while in the bodies of animals.

³⁷ Medicinal uses of blood.

* See Aristotle, *lecture*, n^o 116.

Blood. but to a moderate use of it here no such objection takes place.

In some countries we are told, that the barbarians were accustomed to intoxicate themselves by drinking the warm blood of animals; and as it has been shown that this fluid is the immediate reservoir of the vital principle, it seems by no means improbable that it may be possessed of an inebriating quality. Some expressions in Scripture seem to countenance this hypothesis.

Religious uses of BLOOD. Among the ancients blood was used for the sealing and rarifying covenants and alliances, which was done by the contracting parties drinking a little of each others blood; and for appeasing the manes of the dead, in order to which blood was offered on their tombs as part of the funeral ceremony.

The blood of victims was anciently the portion of the gods; and accordingly was poured or sprinkled on the altars in oblation to them.

The priests made another use of blood, *viz.* for divination: the streaming of blood from the earth, fire, and the like, was held a prodigy or omen of evil.

The Roman priests were not unacquainted with the use of blood in miracles; they had their fluxes of blood from images, ready to serve a turn; witness that said to have streamed from the statue of Minerva at Modena, before the battle at that place. But we know not whether in this their successors have not gone beyond them. How many relations in ecclesiastical writers of Madonas, crucifixes, and wafers, bleeding? At least the liquefaction of the blood of St Januaries at Naples, repeated annually for so many ages, seem to transcend by far all the frauds of the Grecian or Roman priesthood. But the chemists at last got into the secret; and we find M. Neumann at Berlin to have performed the miracle of the liquefaction of dried blood, with all the circumstances of the Neapolitan experiment.

Among the schoolmen we find a famous dispute, under Pope Pius II. whether the blood of Christ, which fell from him in the three days passion, retained or lost the hypostatic union; and consequently whether it was the proper object of adoration. The Dominicans maintained the former, the Franciscans the latter. It seems the Dominican doctrine gained the ascendant, as being fitted to favour the profits of the monks; who becoming possessed some way or other of a few drops of this precious liquor, were secured of ample offerings from the deluded laity, who flocked to pay their homage to the sacred relic. Joseph of Arimathea is said to have first brought into Britain two silver vessels filled with the blood of Christ, which by his order was buried in his tomb. King Henry III. had a crystal, containing a portion of the same blood, sent him by the master of the temple at Jerusalem, attested with the seals of the patriarch; which treasure the king committed to the church of St Peter's Westminster, and obtained from the bishops an indulgence of six years and 116 days to all that should visit it. Mat. Paris even assures us, that the king summoning his nobles and prelates to celebrate the feast of St Edward in St Peter's church, was chiefly *pro veneratione sancti sanguinis Christi nuper adepti*, "in veneration of the holy blood of Christ lately acquired." Divers others of our monasteries were possessed of this profitable relic; as the college of Bon Hom-

mes at Ashridge, and the abbey of Hales, to whom it was given by Henry, son of Richard duke of Cornwall, and king of the Romans. To it resorted a great concourse of people for devotion and adoration; till in 1538, as the reformation took place, it was perceived to be only honey clarified and coloured with saffron, as was shown at Paul's cross by the bishop of Rochester. The like discovery was made of the blood of Christ, found among the relics in the abbey of Fescamp in Normandy, pretended to have been preserved by Nicodemus, when he took the body from the cross, and given to that abbey by William duke of Normandy: it was buried by his son Richard, and again discovered in 1171, and attended with different miracles; but the cheat, which had been long winked at, was at length exposed, the relation of which is given by Speed.

Avenger of BLOOD, among the Jews, was the next of kin to the person murdered, who was to pursue the murderer.

Ecclesiastical judges retire, when judgment is to be given in *cases of blood*, by reason the church is supposed to abhor blood: it condemns no person to death; and its members become irregular, or disabled from their functions, by the effusion of blood.

Field of BLOOD, in Syriac *aceldama*, was a field purchased by the Jews with the thirty pieces of silver which had been given to Judas for betraying his Master, and which he had restored. It still serves for a burial-ground, in which all pilgrims who die in their pilgrimage at Jerusalem are interred.

BLOOD-HOUND, in zoology, the *canis sagax* of Linnaeus*, *le chien courant* of Buffon, the *sleuthounde* of the Scots: The hound or dog, with long, smooth, and pendulous ears.—It was a dog of great use, and in high esteem with our ancestors: its employ was to recover any game that had escaped wounded from the hunter, or been killed and stole out of the forest. It was remarkable for the acuteness of its smell, tracing the lost beast by the blood it had spilt; from whence the name is derived. This species could, with the utmost certainty, discover the thief by following his footsteps, let the distance of his flight be ever so great, and through the most secret and thickest coverts; nor would it cease its pursuit till it had taken the felon. They were likewise used by Wallace and Bruce during the civil wars. The poetical historians of the two heroes frequently relate very curious passages on this subject; of the service these dogs were of to their masters, and the escapes they had from those of the enemy. The blood-hound was in great request on the confines of England and Scotland; where the borders were continually preying on the herds and flocks of their neighbours. The true blood-hound was large, strong, muscular, broad breasted, of a stern countenance, of a deep tan-colour, and generally marked with a black spot above each eye.

BLOOD-Shotten. See OPHTHALMIA.

BLOOD-Spavin. See FARRIERY, § xxxii. 2.

Spitting of BLOOD, or *Hæmoptoe*. See MEDICINE-Index.

Whole and Half BLOOD; a kinsman of the *whole blood* is he that is derived from the same couple of ancestors; whereas a person of *half blood* descends from either of them singly by a second marriage.

BLOOD

Blood.

* See Canis.

Blood.

BLOOD of Christ, the name of a military order instituted at Mantua in 1608. The number of knights was restricted to 20, besides the grand master. Their device was, *Domine, probasti me*; or, *Nihil hoc, triste, recepto*: "Lord, thou hast proved me;" or, "Fortified by this, no evil can prevail."

Precious BLOOD, a denomination given to a reformed congregation of Bernardine nuns at Paris, first established under that name in 1661.

Dragon's BLOOD. See DRAGON.

BLOOD-Stone. See HÆMATITES.

BLOOD-Vessels. See ANATOMY, n^o 123, &c. and Plate XXXIII.

BLOOD-White in ancient law writers, signifies *blood*, and a customary amercement paid as a composition for the shedding or drawing of blood. The word is also written *blodwhite*, *blodwita*, *blodwyta*, *bloodwit*, *blodwit*, *bloudwit*, and *bluidweit*. It is formed from the ancient Saxon *blud*, "blood, and *vite* or *wite*, "a fine or penalty." The word also denotes an exemption from this penalty, granted by the king to certain persons and communities as a special favour. King Henry II. granted to all tenants within the honour of Wallingford—*Ut quieti sint de hidagio et blodwite et bredwite*.

BLOOD-Wort, in botany. See RUMEX.

BLOOD (Thomas), generally known by the appellation of *Colonel Blood*, was a disbanded officer of Oliver Cromwell's, famous for his daring crimes and his good fortune. He was first distinguished by engaging in a conspiracy to surprise the castle of Dublin; which was defeated by the vigilance of the duke of Ormond, and some of his accomplices were executed. Escaping to England, he meditated revenge against Ormond; and actually seized him one night in his coach at St James's-street, where he might have finished his purpose if he had not studied refinements in his vengeance. He bound him on horseback behind one of his associates, resolving to hang him at Tyburn, with a paper pinned to his breast: but when they got into the fields, the duke, in his efforts for liberty, threw himself and the assassin, to whom he was fastened, to the ground; and while they were struggling in the mire, he was rescued by his servants; but the authors of this attempt were not then discovered. A little after, in 1671, Blood formed a design of carrying off the crown and regalia from the tower; a design to which he was prompted, as well by the surprising boldness of the enterprize, as by the views of profit. He was very near succeeding. He had bound and wounded Edwards the keeper of the jewel-office, and had got out of the tower with his prey; but was overtaken and seized, with some of his associates. One of them was known to have been concerned in the attempt upon Ormond; and Blood was immediately concluded to be the ringleader. When questioned, he frankly avowed the enterprize; but refused to discover his accomplices. "The fear of death (he said) should never engage him either to deny a guilt or betray a friend." All these extraordinary circumstances made him the general subject of conversation; and the king was moved with an idle curiosity to see and speak with a person so noted for his courage and his crimes. Blood might now esteem himself secure of pardon; and he wanted not address to improve the opportunity. He told Charles, that he had been engaged, with others, in a design to kill him

with a carabine above Battersea, where his majesty often went to bathe; that the cause of this resolution was the severity exercised over the consciences of the godly, in restraining the liberty of their religious assemblies: that when he had taken his stand, among the reeds, full of these bloody resolutions, he found his heart checked with an awe of majesty; and he not only relented himself, but diverted his associates from their purpose: that he had long ago brought himself to an entire indifference about life, which he now gave for lost; yet could he not forbear warning the king of the danger which might attend his execution: that his associates had bound themselves by the strictest oaths to revenge the death of any of their confederacy; and that no precaution nor power could secure any one from the effects of their desperate resolutions. Whether these considerations excited fear or admiration in the king, they confirmed his resolution of granting a pardon to Blood; but he thought it a requisite point of decency first to obtain the duke of Ormond's consent. Arlington came to Ormond in the king's name, and desired that he would not prosecute Blood, for reasons which he was commanded to give him. The duke replied, that his majesty's commands were the only reason that could be given: and being sufficient, he might therefore spare the rest. Charles carried his kindness to Blood still farther: he granted him an estate of L. 500 a-year in Ireland; he encouraged his attendance about his person; he showed him great countenance; and many applied to him for promoting their pretensions at court. And while old Edwards, who had bravely ventured his life, and had been wounded, in defending the crown and regalia, was forgotten and neglected, this man, who deserved only to be stared at and detested as a monster, became a kind of favourite.—Blood enjoyed his pension about ten years, till being charged with fixing an imputation of a scandalous nature on the duke of Buckingham, he was thrown into prison, where he died August 24. 1680.

BLOODY, something belonging to or abounding with blood.

BLOODY-Flux. See MEDICINE-Index.

BLOODY-hand, is when a trespasser is apprehended in a forest with his hands or other parts bloody; which is a circumstance of his having killed the deer, though he be not found chasing or hunting them.

BLOODY-Rain. See RAIN.

BLOODY-Sweat. Many instances of this are recorded, in which it has been owing to bodily disorder, or extreme mental agitation and agony. See particularly Aristotle's Hist. Animal. lib. iii. cap. 19. apud Oper. tom. i. Thuanus Hist. Temp. &c. lib. ii. apud Oper. tom. i. Melanges d'Histoire et de Literature, &c. par M. V. Marville, tom. iii. p. 149. Acta Physico-Med. Norimbergæ, vol. i. p. 84. and vol. viii. p. 428.

BLOODY-Urine. See MEDICINE-Index.

BLOOM, a mass of iron after having undergone the first hammering called *blomary*. It has yet to undergo many hammerings before it become iron fit for the smith's use, and be first made what they call the *ancony*. See ANCONY.

BLOOT (Peter), a Flemish painter, whose works are not frequently seen in these kingdoms; nor are they easily purchased in Holland, being carefully preserved in private collections, and are highly esteemed.

Blood
||
Bloot.

Blossom
||
Blount.

The subjects he chose to paint were always taken from the lowest life; such as boors drinking, feasting, dancing, or quarrelling; shepherds piping, and sometimes the marriages of villagers. He was a faithful, and indeed too servile an imitator of nature; never departing from the actions, attitudes, or draperies of his models. He showed a good knowledge of the chiaro-scuro, and perspective; he had a delicate manner of penciling, and his colouring was mellow; but he had no idea of elegance: yet his pictures have in many respects great merit, and his defects seem rather imputable to the taste of his country than to his own genius; some of his works being for the lightness of the touch, the neatness of handling, and transparence of colour, equal to the best of his time. He died in 1667.

BLOSSOM, in a general sense, denotes the flower of any plant. See the article FLOWER.

BLOSSOM, in a more proper sense, is restrained to the flowers of trees which they put forth in the spring as the forerunners of their fruit, otherwise called their *bloom*. The office of the blossom is partly to protect, and partly to draw nourishment to, the embryo, fruit, or seed.

BLOSSOM, or *Peach-coloured*, in the manege, a term applied to a horse that has his hair white, but intermixed all over with sorrel and bay hairs. Such horses are so insensible and hard both in the mouth and the flanks, that they are scarce valued; besides they are apt to turn blind.

BLOSSOMING OF PLANTS, the act of blowing, or putting forth flowers or blossoms, called also *flowering*. The blossoming of the Glastenbury thorn piously on Christmas-day-morning, is a vulgar error; owing to this, that the plant, besides its usual blossoming in the spring, sometimes puts forth a few white transient blossoms in the middle of winter. For the blossoming of the rose of Jericho on the same day as it is commonly held in England, or in the time of midnight mass, as it is held in France, is somewhat more than an error, being really a fraud on one side, and a superstition on the other. This rose, whose leaves are only closed and shrivelled up in winter, will, at any time, upon setting its pedicle in water, expand and blossom a-new; because the pedicle being spongy imbibes the fluid apace, and thus fills and swells out the shrivelled leaves: which property some monks have turned to good account.

BLOTELING or BLOOTELING (Abraham), an engraver who flourished about the year 1672. He was a native of Amsterdam, and designed as well as engraved. From the style of his etchings, which have great merit, he is supposed to have frequented the school of the Visschers. He came into England about the year 1672, or 1673, at the time the French invaded Holland; but he did not reside here long. He not only etched, but also scraped, several mezzotintos, which were much esteemed. Vertue informs us, that whilst he was in England, he received 30 guineas for an etching of the duke of Norfolk. From hence he returned to Amsterdam, where, in all probability, he died. In the year 1685, he published at Amsterdam the *gems* of Leonardo Augustino, and etched the plates himself.

BLOUNT (Thomas), a learned English writer of

the 17th century, born at Bordesley in Worcestershire. He had not the advantage of an university education; but, by strength of genius and great application, made a considerable progress in literature. Upon the breaking out of the popish plot in the reign of King Charles II. being much alarmed on account of his being a zealous Roman-catholic, he contracted a palsy; and died in December 1679, aged 61. He wrote, 1. The Academy of Eloquence, containing a complete English rhetoric. 2. Glossographica, or a dictionary interpreting such hard words, whether Hebrew, Greek, Latin, Italian, &c. that are now used in our refined English tongue, &c. 3. Boscobel; or the History of his Majesty's Escape after the Battle of Worcester. 4. A law dictionary. 5. Animadversions upon Sir Richard Baker's chronicle. 6. *Fragmenta Antiquitatis*; and other works.

BLOUNT (Sir Henry), an English writer, born at his father's seat in Hertfordshire in 1602. After a regular education, he set out on his travels in 1634; and getting acquainted with a janizary at Venice, he accompanied him into the Turkish dominions: having been abroad two years, he returned and published a relation of his travels in the Levant, which went through several editions. He was knighted by Charles I. and was at the battle of Edge-hill, at which time he is supposed to have had the charge of the young princes; but, after the king's death, was employed by the parliament, and by Cromwell. Yet after the restoration of the royal family he was appointed high sheriff of the county of Hertford, and from that time lived as a private gentleman above 20 years. He published, 1. An account of his travels. 2. Six comedies written by John Lilly, under the title of *Court Comedies*. 3. The Exchange Walk, a satire; and 4. An Epistle in praise of Tobacco. He died October 9th, 1682.

BLOUNT (Sir Thomas Pope), baronet, an eminent writer, and the eldest son of the former, was born at Upper Holloway, in the county of Middlesex, September 12th, 1649. He was educated under the eye of his father; and always distinguished himself as a lover of liberty, a sincere friend to his country, and a true patron of learning. He was advanced to the degree of baronet by King Charles II. in whose reign he was elected burgess for St Alban's in two parliaments, and was knight of the shire in three parliaments after the Revolution. He wrote in Latin. 1. A critique on the most celebrated writers. 2. Essays on several subjects. 3. A natural history, extracted out of the best modern writers; and, 4. Remarks upon poetry, with characters and censures of the most considerable poets, whether ancient or modern. He died June 30th, 1697.

BLOUNT (Charles), younger brother of Sir Thomas Pope Blount, had also an excellent capacity, and was an eminent writer. His *Anima Mundi* or *An Historical narration of the opinions of the ancients, concerning man's soul after this life, according to unenlightened nature*, gave great offence, and was complained of to the bishop of London. But the work which rendered him most known, was his translation of Philostratus's *Life of Apollonius Tyaneus*, published in 1680; which was soon suppressed, as an attack on revealed religion. Another work of the same complexion he published the same year, called *Great is Diana of the*

Fig. 1.

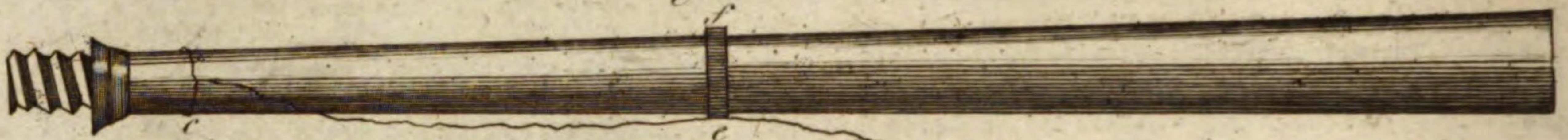


Fig. 2.



Fig. 3.



Fig. 4.



Fig. 5.



Fig. 6.

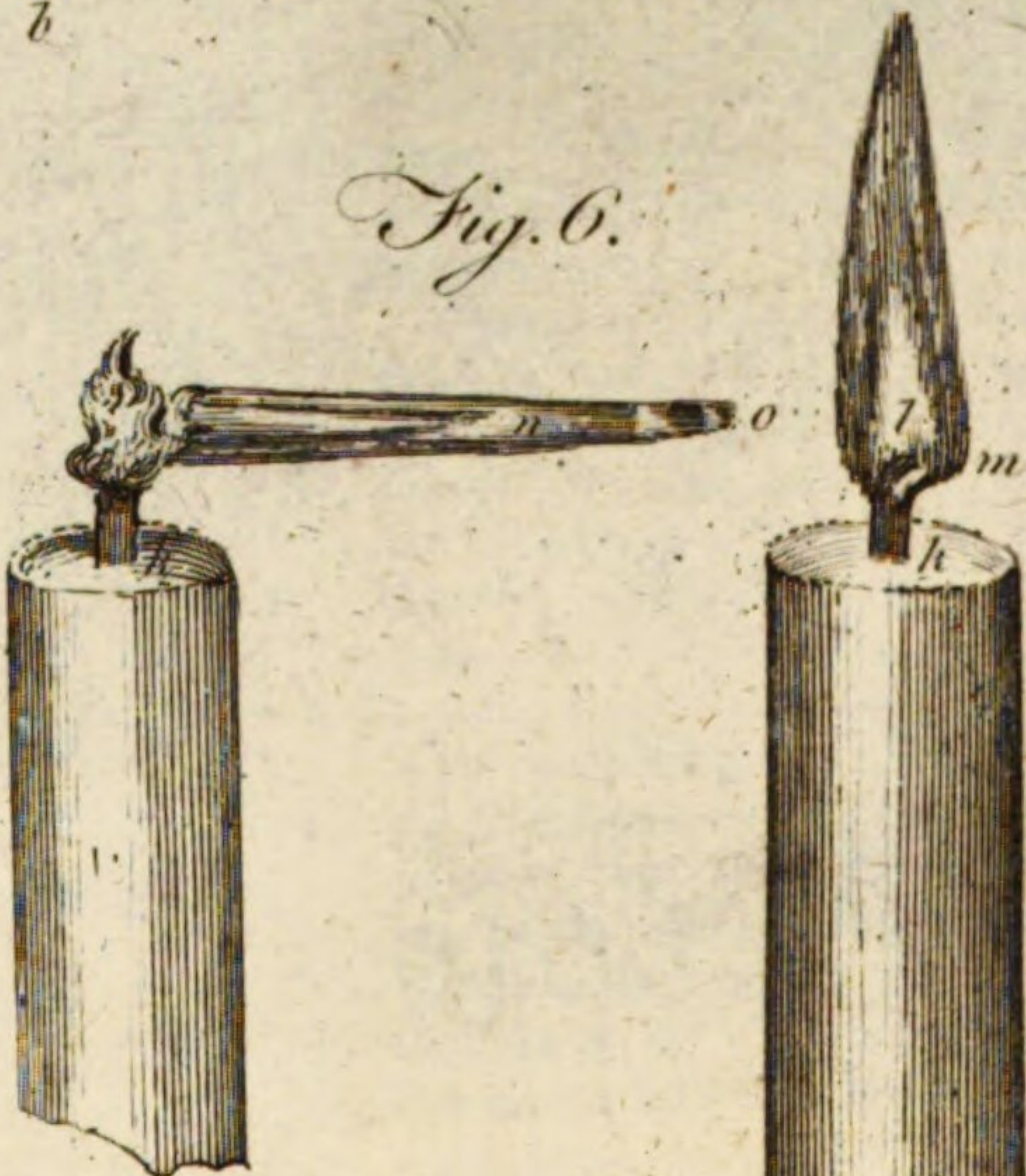


Fig. 10.

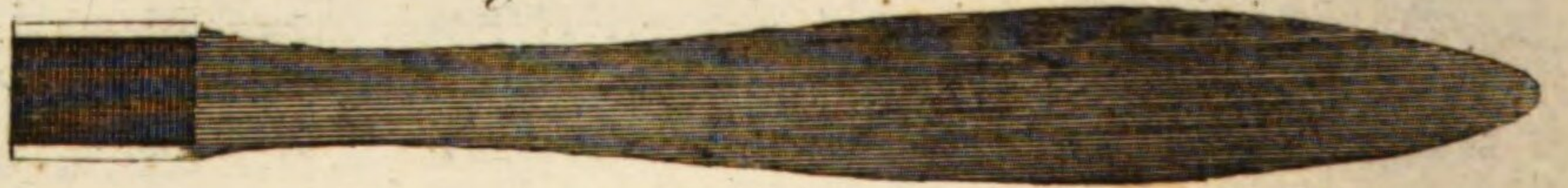


Fig. 9.

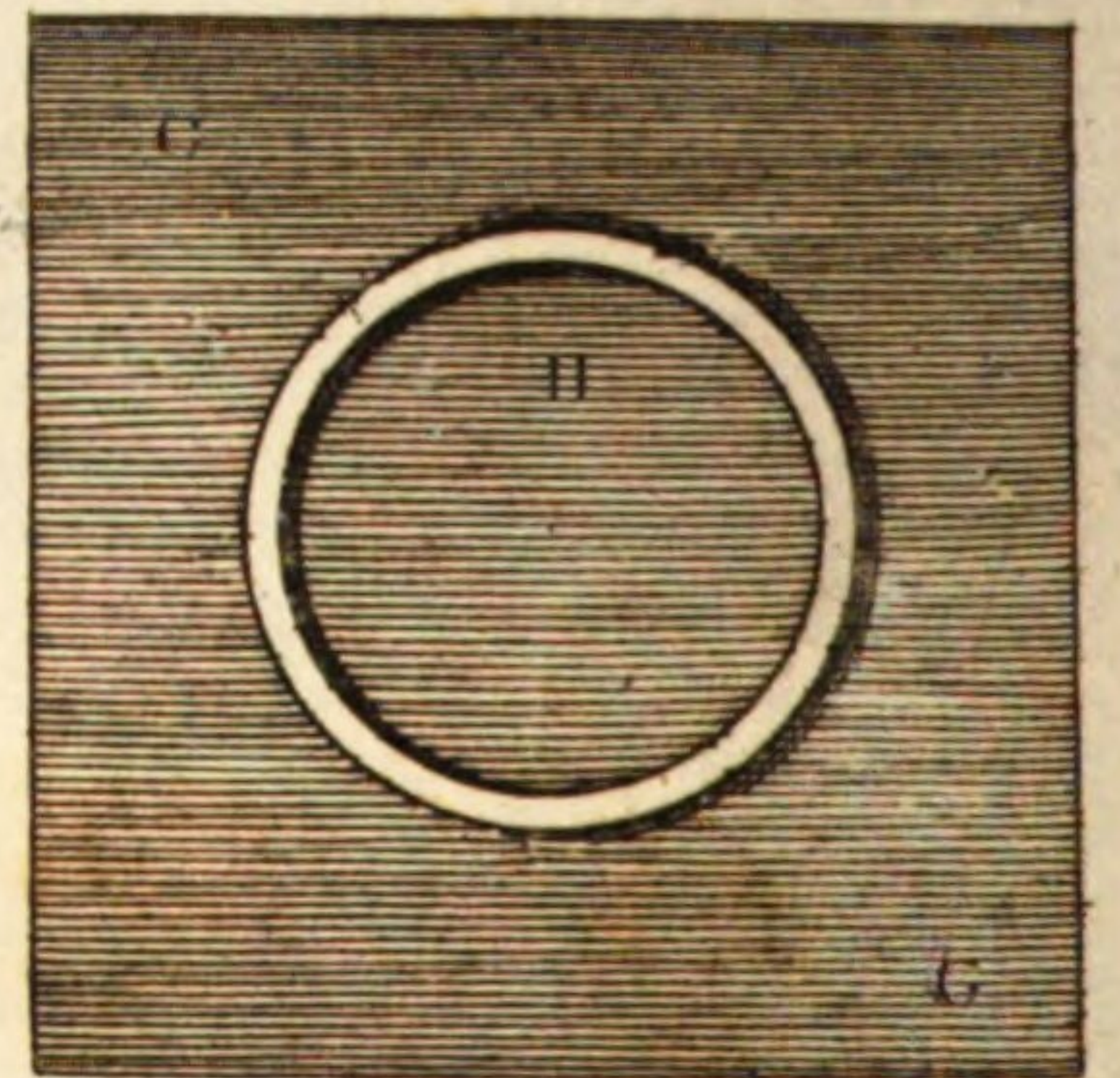


Fig. 7.



Fig. 8.



Blow. *the Ephesians*, &c. in which, under colour of exposing superstition, he struck at revelation. In 1684, he printed a kind of *Introduction to Polite Literature*. In the warmth of his zeal for the Revolution, he wrote a pamphlet to prove King William and Queen Mary conquerors; which was condemned to be burnt by both houses of parliament. The close of his life was very unhappy. For, after the death of his wife, he became enamoured of her sister, who was only scrupulous against their union on account of their prior connection by the marriage; on which he writ a letter on the subject, as the case of a third person, with great learning and address. But the archbishop of Canterbury and other divines deciding against him, and the lady on this growing inflexible, it threw him into a frenzy in which he shot himself, in 1693. After his death, his miscellaneous pieces were collected and published.

BLOW (Dr John), a famous musician and composer, was a native of North Collingham in the county of Nottingham; and was one of the first set of children after the restoration, being bred up under Captain Henry Cook. He was also a pupil of Hingeston, and after that of Dr Christopher Gibbons. On the 16th day of March, 1673, he was sworn one of the gentlemen of the chapel in the room of Roger Hill; and in July 1674, upon the decease of Mr Pelham Humphrey, was appointed master of the children of the chapel. In 1685, he was made one of his majesty's private music; and in 1687, was appointed almoner and master of the choristers of the cathedral church of St Paul. Blow was not a graduate of either university; but archbishop Sancroft, in virtue of his own authority in that respect, conferred on him the degree of doctor in music. Upon the decease of Purcell in 1695, he became organist of Westminster-abbey. In the year 1699, he was appointed composer to his majesty, with a salary. Blow was a composer of anthems while a chapel-boy, and on the score of his merit, was distinguished by Charles II. The king admired very much a little duet of Carissimi to the words 'Dite o Cieli,' and asked of Blow if he could imitate it. Blow modestly answered he would try; and composed in the same measure, and the same key of D with a minor third, that fine song, 'Go, perjured man.' The *Orpheus Britannicus* of Purcell had been published by his widow soon after his decease; and contained in it some of that author's finest songs: the favourable reception it met with was a motive with Blow to the publication in the year 1700, of a work of the same kind, entitled *Amphion Anglicus*, containing compositions for one, two, three, and four voices, with accompaniments of instrumental music, and a thorough-bass figured for the organ, harpsichord, or theorbolite. To this book are prefixed commendatory verses by sundry persons; and among them an ode, in the second stanza of which are the following lines:

' His *Gloria Patri* long ago reach'd Rome,
' Sung and rever'd too in St Peter's dome;
' A canon will outlive her jubilees to come.'

The canon here meant is that fine one to which the *Gloria Patri* in Dr Blow's gamut service is set. Dr Blow set to music an ode for St Cecilia's day, in 1684, the words by Mr Oldham, published together with one

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of Purcell on the same occasion performed the preceding year. He also composed and published a collection of lessons for the harpsichord or spinnet, and an ode on the death of Purcell, written by Mr Dryden. There are also extant of his composition sundry hymns printed in the *Hermonia Sacra*, and a great number of catches in the latter editions of the musical companion. This great musician died in the year 1708, and lies buried in the north aisle of Westminster-abbey. On his monument is the canon above mentioned, engraven on a book with an inscription above it.

BLOW, in a general sense, denotes a stroke given either with the hand, a weapon, or instrument. In fencing, blows differ from thrusts, as the former are given by striking, the latter by pushing.

Military Blow, *alapa militaris*, that given with a sword on the neck or shoulder of a candidate for knighthood, in the ceremony of dubbing him. The custom seems to have taken its rise from the ancient ceremony of manumission. In giving the blow, the prince used the formula *Eslo bonus miles*, "Be a valiant soldier;" upon which the party rose a complete knight, and qualified to bear arms in his own right.

BLOW, in law. See BATTERY.

Fly-Blows, the ova of flies deposited on flesh, or other substances proper for hatching them.

Blow-Pipe, in chemistry and mineralogy, an instrument by which the blast of the breath may be directed upon the flame of a lamp or candle, in such a manner as to vitrify any small portion of mineral substance; and thus the process of assaying in the dry way may be performed in a very short time, where either want of instruments or opportunity prevent other methods from being used.

Mr Bergman observes that this instrument is extremely useful to chemists, as many experiments are daily neglected, either because they require furnaces and a large apparatus of vessels; from the want of time to examine them in the ordinary way; or from the quantity required in the common way for examination, when the matter may be too scarce or too dear. In all these cases the blow-pipe may be advantageously used; as, 1. Most of the experiments which can be performed in the large way may also be done with the blow-pipe. 2. The experiments which in the large way require many hours, may in this method be finished in a few minutes; and, 3. The smallest particle is sufficient. The only defect is, that the proportions cannot be determined with any precision; and therefore where the experiments can be tried on a large scale, it is always to be preferred. "But the first inquiry to be made," says our author, "is, *what* a substance contains, not *how much*; and I have learned by the experience of many years, that these trials in small suggest the proper methods of instituting experiments in large. These experiments besides have some advantage over those conducted in crucibles, viz. we can see all the phenomena from beginning to end, which wonderfully illustrates the series of operations and their causes. Experiments made in crucibles are often fallacious, as the substance of the vessel itself is corroded. We suppose that lime or magnesia melted with fixed alkali are united with it in the way of solution;

Blow,
Blow-pipe.

The blow-pipe useful to chemists.

In what cases it may be advantageously employed.

Blow pipe. lution; but the globule, when well fused in the spoon, by its transparency permits us plainly to see that, except the siliceous part, it is only mechanically mixed. The most intense degree of heat may in this way be obtained in a few minutes, which can scarcely be done in a crucible in many hours."

3
When the instrument was first introduced.

4
Bergman's description of the blow-pipe.

Plate
XCIX.

The blow-pipe was first introduced into the chemical apparatus about 50 years ago by the celebrated Swedish metallurgist Dr Andreas Swab, and the instrument was afterwards greatly improved by Messrs Cronstedt, Rinman, &c. and Dr Engestrom has an express treatise upon the subject. Mr Bergman proposes that the tube should be made of pure silver, to prevent it from being injured by rust; with the addition of a small quantity of platina, to give a necessary hardness. It consists of three parts, which may be occasionally joined: An handle (fig. 3.) terminating in a truncated conical apex *a a*, which may by twisting be so adapted to the aperture *b* (fig. 4.) as to shut it more closely than can be done by a screw. It was an improvement of former chemists to have a hollow ball on the tube to collect the moisture of the breath, which if suffered to accumulate would greatly diminish the intensity of the flame. Instead of this Mr Bergman made use of the little box (fig. 4.) formed of an elliptical plate, so bended through the centre that the opposite sides become parallel, and are joined round by a plate equal in breadth to *c c*. Such a box collects the moisture of the breath as well as the sphere, and is besides attended with the advantage of a compressed figure and smaller circumference. The aperture *b* is somewhat conical, and hollowed out of the solid piece; and has no margin turned inward, lest the efflux of the fluid collected after long blowing, or the cleansing of the internal parts, should in any degree be prevented. The tube (fig. 5.) is very small, and its shorter conical end *e e* exactly fitted to the aperture *f*, so that no air can escape except through the orifice *g*. Many of those tubes should be provided with orifices of different diameters, to be applied on different occasions: the orifice *g* itself ought to be smooth and circular, otherwise the cone of flame hereafter to be mentioned will be divided. The bands (*bb ii*) prevent the conical apices (*aa, ee*) from being thrust in too far, and also serve another purpose; for when these apices are, by repeated attrition, at last so much diminished as to fall out spontaneously, by filing away a little of the bands they may again be made tight. The figures represent the whole apparatus of the proper size.

Fig. 3, 5.

5
How to supply it with a constant stream of air.

The greatest difficulty attending the use of the blow-pipe is the supplying it with a constant stream of air by means of the breath; for to such as are unaccustomed to it, it appears a contradiction to think of blowing a stream of air out by the mouth, at the same time that we are drawing it in by the nostrils to supply the necessary function of respiration. An uninterrupted stream of air, however, is absolutely necessary; and, "to succeed in this operation (says Mr Bergman) without inconvenience, some labour and practice are necessary. The whole artifice, however, consists in this, that while the air is inspired through the nostrils, that which is contained in the mouth be forced out through the tube by the compression of the cheeks. To some persons this is extremely difficult; but fre-

quent trials will establish the habit; so that a continual stream of air can be supplied for a quarter of an hour or more, without any other inconvenience than the lassitude of the lips compressing the tube. A very great and obvious improvement, however, is still suggested by Dr Berkenhout, viz: to apply the tube to the wind-bag of a bagpipe; which being first blown full, may easily be kept so; and being compressed by the arm, will produce a blast either strong or weak as we have a mind. It will be a still farther improvement to supply this bag by means of a small bellows instead of blowing into it with the mouth: for thus the air will be more free from moisture, and also fitter for the support of flame, in other respects; as there is always a considerable quantity of fixed air produced at every respiration, which, according to that quantity, must unfit the air for keeping up the flame, and consequently render the heat less intense.

With regard to the flame proper to be chosen, Mr Bergman directs a slender candle, either of wax or tallow (fig. 6.), with a cotton wick (*l l*). The burned top must be cut at such a length, that the remainder may be bent a little (*l m*). The orifice (*g*) is to be held above and near to this arch, perpendicular to (*l m*), Fig. 5, 6. and the air equably expressed. The flame being forced to one side by the violence of the blast, exhibits two distinct figures; the internal figure (*l n*), conical blue, and well defined; at the apex of this, *n*, the most violent heat is excited; the external flame (*l o*), brownish, vague, and indetermined; which is spoiled of its phlogiston by the surrounding atmosphere, and occasions much less heat at its extremity (*o*) than the interior flame does.

Dr Black, as well as all other eminent chemists, greatly recommend the use of the blow-pipe for chemical experiments on minerals. The construction recommended by him differs not from that already described; only he says, that it may be made of tin, a cheaper material than silver; though formerly they were made of glass. The small stream of air issuing from the extremity of the tube, being more intimately mixed with the flame, and agitated with it, occasions a more complete consumption of the vapour arising from the candle, and makes it produce much more heat; so that any small body exposed to the extremity of the flame is heated to a surprising degree. Several artists who work in metals, as the goldsmiths, &c. find this instrument useful in soldering small pieces of metal together; and it is also used by the chemists in examining the effects of violent heat upon small bodies. Some of the artists who use it much, supply the stream of air with a pair of bellows placed under the table, with a pipe rising up through it, and to which the blow-pipe is fixed. In the examination of ores, the more simple instrument is preferred; and by a little practice it is easy to blow a continued stream of air with the mouth, by keeping it always full, and drawing in the air by the nostrils, which answers the same purpose as the upper part of a double bellows. Mr Cronstedt used the blow-pipe much in making the experiments on which his system of mineralogy is founded, blowing air through a bit of charcoal: and though the specimens are small, we can see the changes they undergo as well as if they were larger; and the eye can be assisted by a magnifying glass.

Blow-pipe.
6
Dr Berkenhout's improvement.

7
A candle proper for producing the flame.

8
Two kinds of flame produced by the blow-pipe.

9
Dr Black's directions concerning this instrument.

10
Blow-pipe useful in soldering, &c.

The

Blow-pipe.

11
Why the
blow-pipe
raises such
an intense
heat.

11
Mr Cron-
stedt's
blow-pipe

The reason of the intense heat produced by the blow-pipe is, that in the ordinary way of burning, the air acts only upon the external surface of the fuel, so that it is not so completely inflamed.

The blow-pipe used by Mr Cronstedt is composed of two parts; and this for the facility both of making, carrying it along, and cleansing it in the inside when necessary. The two parts are represented separate, and of the true size; the figure of the instrument, when these are put together, may be easily conceived. The globe *a* (fig. 2.) is hollow, and made on purpose to condense the vapours, which always happen to be in the blow-pipe when it has been used some time: if this globe was not there, the vapours would go directly with the wind out into the flame, and thereby cool the assay. The hole in the small end *b*, through which the wind comes out, ought not to be larger than the size of the finest wire. This hole may now and then happen to be stopped up by something coming into it, so as to hinder the force of the wind: one ought therefore to have a piece of the finest wire, to clear it with when required; and, in order to have this wire the better at hand, it may be fastened round the blow-pipe, in such a manner as is represented in fig. 1.: *c* is the wire fastened round the blow-pipe, and afterwards drawn through a small hole at *e*, made in the ring *f*, to keep it more steady. In order to determine the most convenient proportions of this instrument, several blow-pipes of different sizes, both bigger and smaller, have been tried: the former have required too much wind; and the latter, being too soon filled with the wind, have returned it back again upon the lungs: both these circumstances hindered greatly the experiments, and are perhaps even prejudicial to the health. The size here given is found to answer best; and though the hole must be as small as above mentioned, yet the sides of the pipe at the point must not be thinner, nor the point narrower, than here represented, else it will be too weak, and not give so good a flame. It is also to be observed, that the canal throughout the pipe, but particularly the hole at the small end, must be made very smooth, so that there be no inequalities in it; the wind would else be divided, and consequently the flame made double. That blow-pipe is to be reckoned the best, through which can be formed the longest and most pointed flame from off a common-sized candle. These blow-pipes are commonly made of brass or silver.

13
Of the sup-
ports pro-
per for the
matter sub-
jected to
the flame of
the blow-
pipe.

There are two different kinds of matter made use of for the support of those substances usually examined by the blow-pipe: the one is charcoal of fir, or beech, cut into the form of a parallelopiped; the other a silver, or, which is better, a golden spoon, fitted with a wooden handle. The former is generally used, excepting where phlogiston is to be avoided, or the subject of examination is apt to be absorbed by the charcoal. The golden spoon should be much less than the figure (7.), as the bulk of the support prevents the heat from being raised to a proper degree. To prevent the fine light particles from being carried off by the blast, a small cavity should be hollowed out in the charcoal; in which, being partly protected by another smaller piece of charcoal, they may be exposed to the apex of the flame.

Were it possible to procure a sufficient quantity of

dephlogisticated air, experiments with the blow-pipe could be rendered still more important than they are, as we might by this means be able to fuse and vitrify substances *per se*, which we are now scarce able to do with the most powerful fluxes. The difficulty of procuring this kind of air, however, has as yet, in a great measure, excluded the use of it from chemistry, though M. le Blond, *Medecin Naturalist du Roi*, in a letter to the editor of the *Journal de Physique* for February 1787, proposes, instead of blowing through the tube, to adapt to the wide end of it a leathern bag, the size of an ox's bladder, filled with pure air. Were this bag made to communicate, by means of a pair of small bellows, with a reservoir containing a considerable quantity of this dephlogisticated air, there is no doubt that many chemical operations might by its means be very advantageously performed; and we are already assured, that, by the use of this kind of air, platina itself may be melted. As dephlogisticated air, however, has not yet come into use, we can only expect such effects as may be produced by a violent blast of common atmospheric air; and for this purpose we must accommodate ourselves with proper fluxes. The following are recommended by Mr Bergman.

Blow-pipe.

14
Intense heat
excited by
dephlogisti-
cated air.

1. The phosphoric acid, or rather the microcosmic salt, as it is called, which contains that acid, partly saturated with mineral, partly with volatile alkali, and loaded besides with much water and a gelatinous fat. This salt, when exposed to the flame, boils and foams violently, with a continual crackling noise, until the water and volatile alkali have flown off; afterwards it is less agitated, sending forth something like black scoriae arising from the burned gelatinous part: these, however, are soon dispelled, and exhibit a pellucid sphericle encompassed by a beautiful green cloud, which is occasioned by the deflagration of the phosphorus arising from the extrication of the acid by means of the inflammable matter. The clear globule which remains, upon the removal of the flame, continues longer soft than that formed by borax; and therefore is more fit for the addition of the matter to be dissolved. The volatile alkali is expelled by the fire; therefore an excess of acid remains in what is left behind, which readily attracts moisture in a cool place.

15
Properties
of the phos-
phoric acid
as a flux.

2. The mineral alkali, or sal sodæ, when put upon charcoal, melts superficially, penetrates the charcoal with a crackling noise, and then disappears. In the spoon it yields a permanent and pellucid sphericle as long as it is kept fluid by the blue apex of the flame; but when the heat is diminished, it becomes opaque, and assumes a milky colour. It attacks several earthy matters, particularly those of the siliceous kind, but cannot be employed on charcoal for the reasons assigned above.

16
Of the mi-
neral alkali.

3. Crystallized borax, exposed to the flame urged by the blow-pipe or charcoal, first becomes opaque, white, and excessively swelled, with various protuberances, or branches proceeding out from it. When the water is expelled, it easily collects itself into a mass, which, when well fused, yields a transparent sphericle, retaining its transparency even after cooling. If calcined borax be employed, the clear sphericle is obtained the sooner.

17
Of borax.

Having thus provided every thing necessary, the following directions are next to be attended to

S f 2

1. A

Blow-pipe.

18
Directions
with regard
to the can-
dle.19
With re-
gard to the
matter ex-
posed to the
flame.20
Properties
of salts
when expo-
sed to the
action of
the blow-
pipe.21
Of the acid
of arsenic.22
Of molyb-
dæna.23
Of borax.

1. A common tallow candle, not too thick, is generally preferable to a wax candle, or to a lamp. The snuff must not be cut too short, as the wick should bend towards the object.

2. The weaker exterior flame must first be directed upon the object, until its effects be discovered; after which the interior flame must be applied.

3. We must observe with attention whether the matter decrepitates, splits, swells, vegetates, boils, &c.

4. The piece exposed to the flame should scarce ever exceed the size of a pepper-corn; but ought always to be large enough to be taken up by the forceps (fig. 10.) When the particle is too large, part of it must necessarily be without the focus; and thus cool both the support and the part immersed in the blue apex *n* (fig. 6.) It may, however, be broken into pieces sufficiently small by means of the hammer (fig. 8.), upon the steel plate (fig. 9.); any of the small parts being prevented from flying off by the ring H.

5. A small piece should be added separately to each of the fluxes: concerning which it must be observed, whether it dissolves wholly, or only in part; whether this be effected with or without effervescence, quickly or slowly; whether the mass be divided into a powder, or gradually and externally corroded: with what colour the glass is tinged; and whether it becomes opaque, or remains pellucid.

Having given these directions, our author (Mr Bergman) proceeds next to consider the subjects proper to be examined by the blow-pipe. These he divides into four classes: 1. Saline; 2. Earthy; 3. Inflammable; and, 4. Metallic.

I. The *Salts*, though distinguished by their taste and solubility in water, differ so much in degree, that it is impossible to distinguish them absolutely from the earths by any natural boundaries. Many of them, when exposed to the flame, easily melt by the water of crystallization they contain. After this is dissipated, they split; and by a more intense heat are readily fused: others are deprived of their water without any fusion; and then melt once by a heat more or less intense, according to their nature; and some fly off with the heat.

Acids in general cannot bear the action of the blow-pipe, such at least as are easily kept in a fluid state. It is otherwise, however, with some of those which appear solids. The acid of arsenic upon charcoal attracts the inflammable matter, generates white arsenic, and flies off in vapours. In the spoon it melts without emitting smoke, unless it can acquire phlogiston either from the support on which it is placed, or the flame of the candle. The acid of molybdæna, according to our author, seems to be the basis of some metal, as it has a specific gravity of 3,461, possesses the property of tinging fluxes, and decomposing the phlogisticated alkali; he adds, "Is this the acid of tin?" This acid is absorbed by charcoal; and in the spoon emits a white smoke, which on touching the apex of the interior flame, assumes a beautiful blue colour, and again grows white upon exposure to the exterior flame. It tinges microcosmic salt of a fine green; borax assumes an ash colour by reflection, but has a dark violet when we look through it. The acid of borax, commonly called *sal sedativus*, easily liquefies, in the same manner with borax itself, but does not smell so much as that salt does. It leaves a fixed pellucid glo-

bule. Acid of tartar liquefies on the first contact of the exterior flame, swells, foams, grow black, and sends forth a smoke and blue flame, leaving a spongy coal, the greatest part of which is soon converted into ashes of a calcareous nature. The combustion, however, must be slow; and the weakest part of the flame only employed, in order to observe these changes distinctly. By the contact of the exterior flame, crystallized acid of sugar is first made of an opaque white, then melts, and, lastly, flies off without leaving any residuum. Acid of phosphorus easily melts into a pellucid globule, which afterwards deliquesces in the air. Crystallized vegetable alkali first becomes opaque, and decrepitates long and violently; then melts into a globule, which remains in the spoon; but expands on charcoal, and is absorbed with a crackling noise. The volatile alkali liquefies a little, and is then dissipated.

Several of the natural salts flow twice, according to the quantity of water they contain in their crystals. The decrepitating salts are broken and dispersed by a sudden heat. Of this kind are vitriolated tartar, vitriolic sal ammoniac, common salt, and sal digestivus. Those which have a volatile alkali for their basis, fly off in a very short time.—By the application of the external flame, salt of amber laid on charcoal liquefies and smokes, the contact of the internal flame sets it on fire, and it continues to burn with a blue flame till it totally disappears. The same thing takes place when it is put in the spoon, excepting when it contains too great a quantity of oil, which indeed very frequently happens. In this case some traces of coal are to be met with. The spurious salt of amber presents different phenomena according to the substances made use of in adulterating it.

The detonating salts, into which the nitrous acid always enters as a component part, liquefy in the spoon, and are not decomposed on the charcoal until it takes fire: they are then decomposed with violent flame and noise, but which is different in degree according to the basis with which the nitrous acid is united. Thus the nitrous acid combined with vegetable alkali burns with a blue flame, but with the mineral and volatile alkali has a yellow one.

The carbonaceous salts yield spongy coals by the combustion of their acid, which by ignition becomes white, leaving their alkaline basis pure behind them. These are the acid of tartar, crude tartar, salt of sorrel, and tartarized mineral and vegetable alkali.

The hepatic salts, when put on charcoal, melt into a red or yellow mass, which diffuses an hepatic smell, especially when moistened by an acid. To this class belong all those fixed in the fire which contain the vitriolic acid, and which when saturated with phlogiston produces sulphur; such as vitriolated tartar and Glauber's salt.

Few of the earthy salts flow sufficiently thin to be reduced into a perfect globule; nor do they all actually enter into fusion, though the water of crystallization excites a great foam by its going off. Those which contain the vitriolic acid effervesce violently with borax and microcosmic salt, but are dissolved with difficulty by the salt of soda.

The intumescent salts. 1. Vitriolated magnesia, commonly called *Epsum-salt*, swells, foams, and may be melted by being repeatedly exposed to the flame. 2.

Alum

Blow-pipe.
24
Of tartar.25
Of the acid
of sugar.26
Of the acid
of phospho-
rus.27
Volatile al-
kali.28
Of the de-
crepitating
neutral
salts.29
Of salt of
amber.30
Detonating
salts.31
Carbonace-
ous salts.32
Hepatic
salts.33
Earthy
salts.34
Intumes-
cent salts.

Blow-pipe.

Alum is somewhat different; for finally all ebullition ceases, and the mass remains incapable of further change by fire than to split. When hot, it is variegated with blue spots. 3. A combination of lime with acetous acid swells much like alum, but scarcely adheres to the charcoal. 4. Nitrated magnesia swells with a crackling noise, but without any detonation. 5. To this class also belongs the combination of marine acid with magnesia.

35
Gypsum
fusible by
the blow-
pipe.

Gypsum eluded the utmost force of Mr Pott's furnace, but may be fused in a moment by exposing a section of the lamella to the blue flame. Though naturally pellucid, it instantly becomes opaque; and the water it contains flies off without any ebullition.

36
Substances
soluble in
borax and
microcosmic salt.

The following substances are soluble in borax and microcosmic salt with effervescence.

1. Lime, magnesia, alum, and combination of lime with acetous acid.

2. The metallic salts which do not decrepitate. Some of these containing either a large quantity of water in their crystals, or obstinately retaining their acid, flow in the fire, while others only foam. Most of them recover, in part at least, their metallic appearance, especially when they touch the coal, leaving at the same time a shapeless scoria. By the addition of borax, the scorice are dissolved, and the regulus better collected; the fluxes are tinged in the same manner as by the metallic calces.

3. The decrepitating metallic salts; lead combined with nitrous acid, and antimony with that of tartar.

4. Volatile metallic salts which have mercury for their basis. Those which contain marine acid in general fly off more quickly than those in which the metal is combined with any other menstruum.

5. Detonating metallic salts, as silver, mercury, lead, and bismuth united with nitrous acid.

6. The intumescent metallic salts, vitriolated and nitrated copper, iron and cobalt vitriolated, and nitrated zinc. These swell with noise and a certain degree of ebullition on the first contact of the flame, but afterwards remain unchanged.

7. The fusible metallic salts, as silver and lead combined with vitriolic acid, and zinc combined with marine acid.

8. Antimony combined with acid of tartar, a carbonaceous metallic salt.

37
Beautiful
green flame
from cop-
per com-
bined with
marine acid.

9. Metallic salts communicating a certain colour to the flame. Blue vitriol, and solution of copper in nitrous acid, produce a greenness: but solution of copper in spirit of salt acts with much more efficacy. The green crystals of this first grow red by the contact of the external flame; afterwards they liquefy and grow black, making the flame at first of a deep blue, which afterwards verges to a green. The flame thus tinged expands much, and remains in that state until the whole of the salt be dissipated. This green salt, added to microcosmic salt in fusion, immediately shows a beautiful flame: the clear globule is tinged green, and does not grow opaque or brown, unless a large quantity of the microcosmic salt be added; a circumstance which takes place much sooner on adding a small quantity of borax.

38
Calcareous
earth.

II. *Earthy Substances.*—1. Crude calcareous earth effervesces a little with mineral alkali, and is divided in-

to small particles, but sparingly dissolved. When over-burned, it seems not to be divided or diminished. The former dissolves in borax with effervescence; but the latter scarcely produces any bubbles. The same phenomena takes place with microcosmic acid, only the effervescence is somewhat greater. A very small piece of calcareous earth is easily dissolved in borax and microcosmic salt, yielding quite pellucid spherules: but if more earth be gradually added, the flux, saturated at length, retains the dissolved matter indeed while in perfect fusion, but on removing it from the flame, the part which was taken up by the heat alone soon separates. Hence clouds first begin to appear, and at length the whole globule becomes opaque, but recovers its transparency again by fusion. If the melted pellucid globule, however, which would grow opaque by cooling, be plunged while hot into melting tallow, water, or other substances likewise hot (for cold generally cracks it), so as to grow suddenly hard, it retains its transparency; the particles being as it were fixed in that state which is necessary to transparency.

Blow-pipe.

2. Terra ponderosa, exposed alone to the flame, becomes caustic, soluble in water, and loses its property of effervescing with acids. It effervesces a little, and is sensibly diminished by salt of soda; dissolves with a slight effervescence in borax, as well as in microcosmic salt, but effervesces somewhat more violently in the latter.

39
Terra pon-
derosa.

3. Magnesia by itself loses its aerial acid, and with it the property of effervescing with acids. In salt of soda, it is scarcely diminished, but effervesces a little. It dissolves in borax also, with a slight effervescence; and likewise in microcosmic salt, but with a greater effervescence.

40
Magnesia.

4. Common clay contains a number of heterogeneous particles, particularly siliceous earth, of which the quantity is generally one half of the whole. When pure clay therefore is required, the earth of alum digested in an alkaline lixivium, and well washed, must be employed. This earth, on exposure to the flame, grows hard, contracts in bulk, but does not melt. It effervesces a little in sal soda, but is sparingly dissolved. In borax it dissolves with a very considerable effervescence, and with a still greater in microcosmic acid.

41
Clay.

5. Siliceous earth, by itself, is not fused. In sal soda it dissolves with remarkable effervescence; and if the siliceous earth dissolved exceeds the weight of the flux, it yields a pellucid glass. This, and all the other operations with sal soda, must be performed in a spoon. In borax it dissolves slowly, without any effervescence; and in a similar manner, only still more slowly, in microcosmic acid.

42
Siliceous
earth.

Mr Bergman next enumerates the various earths of all different kinds which he had subjected to the blow-pipe; and of these he found that the following did not without the utmost difficulty show any signs of fusion: viz. Pure asbestos, refractory clay, pure mica, sapphire, flint, and steatite. The four last are indurated by fire. Of the same kind are the chrysolite and emerald, chalcidony, cornelian, hydrophanus, siliceous, jasper, onyx, opal, and quartz. The rest are fusible either by themselves or with the addition of proper fluxes. On these, he observes, in general, that when the effervescence is to be examined, only a very little piece of the matter

43
Of various
other earths
and stones.

Blow-pipe. is to be added to the flux; as the most subtile powder contains air, which being expelled by the heat, forms an appearance of effervescence. 2. The solution is often accelerated by lime, spathum ponderosum, gypsum, and other additions. 3. Gypsum alone is often an excellent flux. With an equal quantity of mineral fluor it is easily reduced to a pellucid globule, which grows white and opaque on cooling. The spathum ponderosum also unites with mineral fluor; but the mass does not become pellucid.

44
Of inflammable substances.

III. Most *Inflammable Substances*, when exposed to the apex of the flame, begin to liquefy, unless they have a great quantity of earth in their composition; which, however, does not generally prevent their inflammation. When they are once inflamed, the blast ought to be stopped until they have burned away either alone or with a flux; after which the residuum is to be examined by the flame. The most remarkable appearances exhibited by inflammable substances, when examined by the blow-pipe, are the following.

45
Ambergris.

1. Ambergris burns with a white, smoky, and odoriferous flame, until it be totally consumed; but when impure, it is extinguished, leaving behind a black mass which soon grows white by ignition, and consists partly of calcareous powder. 2. Transparent amber exhibits almost the same appearance, but vanishes totally by heat in the spoon: so that in this way we can scarcely form any judgment of the residuum; which, however, is easily obtained from opaque amber.

46
Amber.

3. Pure asphaltum burns with smoke, and is totally consumed without any residuum. 4. Mountain pitch leaves black scorix, shining, and of a brittle nature.

47
Asphaltum, &c.

5. Bituminous schist and lithanthrax, besides their matrix, leave an oily coal, or even spongy scorix, if the residuum liquefies at all. 6. Common sulphur readily melts alone, and grows red; after which it takes fire, and is consumed with a blue flame and a most penetrating and suffocating odour. 7. Molybdæna contains a portion of common sulphur united to a peculiar acid. It does not take fire, and suffers but little change on the charcoal; but on being exposed to the flame in the spoon, it deposits a white smoke in direction of the blast. This smoke grows blue by the contact of the inferior flame, but loses its colour by the exterior one. It undergoes little change by borax or the microcosmic salt, but dissolves in salt of soda with violent effervescence. It grows red and transparent by fusion; and when cold, assumes a dilute red colour and

48
Sulphur.

49
Molybdæna.

opaque, with an hepatic smell. 8. Plumbago emits smoke on burning, but which is only perceptible the instant the flame ceases. It differs from molybdæna in not depositing any white powder, and particularly in not being taken up by salt of soda. It is not changed by borax or microcosmic salt.

50
Plumbago.

51
Inflammable ores.

Inflammable ores take fire with difficulty; some are scarcely changed, while others are consumed or fly off, leaving the metallic calx behind.

52
Of the fluxes.

The fluxes in general are tinged by phlogiston; but unless this be fixed by some metallic calx, it is easily destroyed by burning.

53
Of the perfect metals.

IV. The perfect *Metals* lose no part of their phlogiston given in the most intense heat; and when calcined in the moist way, recover their former nature by simple fusion. The imperfect metals are calcined by fire, especially by the exterior flame; and then, in order to

their being reduced, indispensably require the contact of a phlogistic substance. With respect to fusibility, the two extremes are mercury and platina: the former being scarce ever seen in a solid form, and the latter almost as difficult of fusion. The metals therefore may be ranked in this order, according to their degrees of fusibility. 1. Mercury. 2. Tin. 3. Bismuth. 4. Lead. 5. Zinc. 6. Antimony. 7. Silver. 8. Gold. 9. Arsenic. 10. Cobalt. 11. Nickel. 12. Iron. 13. Manganese. 14. Platina. The two last do not yield to the blow-pipe, and indeed forged iron does not melt without difficulty; but cast iron perfectly.

Blow-pipe.
Of the different degrees of fusibility of the metals.

55
Manganese and platina do not yield to the blow-pipe.

Metals in fusion affect a globular form, and easily roll off the charcoal, especially when of the size of a grain of pepper. Smaller pieces therefore ought either to be used, or they should be placed in hollows made in the charcoal. On their first melting they assume a polished surface, an appearance always retained by the perfect metals; but the imperfect are soon obscured by a pellicle formed of the calx of the metal. The colours communicated by the calces vary according to the nature of the metal from which the calx is produced. Some of the calces easily recover their metallic form by simple exposure to flame upon the charcoal; others are reduced in this way with more difficulty; and some not at all. The reduced calces of the volatile metals immediately fly off from the charcoal. In the spoon they exhibit nitrous globules; but it is very difficult to prevent them from being first diffused by the blast.

56
General appearance of metals before the blow-pipe.

The metals are taken up by the fluxes: but as mineral alkali yields an opaque spherule, it is not to be made use of. Globules of borax dissolve and melt any metallic calx; and unless too much loaded with it, appear pellucid and coloured. A piece of metal calcined in the flux produces the same effect, but more slowly. A portion of the calx generally recovers its metallic form, and floats on the melted matter like one or more excrescences. In proportion as the globule is more loaded it extends itself more on the charcoal, and at length cannot assume a globular form; for the metallic additament augments the attraction for phlogiston.

57
Fluxes proper to be used with metals.

The calces of the perfect metals are reduced by borax in the spoon, and adhere to it at the point of contact, and there only. The microcosmic salt acts like borax, but does not reduce the metals. It attacks them more powerfully on account of its acid nature; at the same time it preserves the spherical form, and therefore is adapted in a peculiar manner to the investigation of metals.

58
Reduction of the calces of perfect metals.

The tinge communicated to the flux frequently varies, being different in the fused and in the cooled globule; for some of the dissolved calces, while fused, show no colour, but acquire one while cooling; but others, on the contrary, have a much more intense colour while in the state of fluidity. Should the transparency be injured by too great a concentration of colour, the globule, on compressing it with the forceps, or drawing it out into a thread, will exhibit a thin and transparent mass: but if the opacity arises from supersaturation, more flux must be added; and as the fluxes attract the metals with unequal forces, the latter precipitate one another.

59
Colours acquired by the fluxes.

Metals when mineralized by acids have the properties

Blow-pipe.
60
Of metals
mineralized by
acids.

ties of metallic salts; when mineralized by fixed air, they possess the properties of calces, that volatile substance being easily expelled without any effervescence; but when combined with sulphur, they possess properties of a peculiar kind. They may then be melted, or even calcined upon the charcoal, as also in a golden or silver spoon. The volatile parts are distinguished by the smell or smoke; the fixed residua by the particles reduced or precipitated upon iron, or from the tinge of the fluxes.

61
Of gold.

Gold in its metallic state fuses on the charcoal, and is the only metal which remains unchanged. It may be deprived of its phlogiston in the moist way by solution in aqua regia; but to calcine it also by fire, we must pursue the following method: To a globule of microcosmic salt let there be added a small piece of solid gold, of gold leaf, purple mineral, or, which is best of all, of the crystalline salt formed by a solution of gold in aqua regia containing sea-salt. Let this again be melted, and added while yet soft to turbith mineral, which will immediately grow red on the contact. The fusion being afterwards repeated, a vehement effervescence arises; and when this is considerably diminished, let the blast be stopped for a few moments, again begun, and so continued until almost all the bubbles disappear. After this the spherule, on cooling, assumes a ruby colour; but if this does not happen, let it be just made soft by the exterior flame, and upon hardening this tinge generally appears. Should the process fail at first, owing to some minute circumstances which cannot be described, it will succeed on the second or third trial. The ruby-coloured globule, when compressed by the forceps while hot, frequently becomes blue; by sudden fusion it generally assumes an opal colour, which by refraction appears blue, and by reflection of a brown red; if further urged by the fire, it loses all colour, and appears like water; but the redness may be reproduced several times by the addition of turbith mineral. The flux is reddened in the same manner by the addition of tin instead of turbith; but it has a yellowish hue, and more easily becomes opaque; while the redness communicated by turbith mineral has a purple tinge, and quite resembles a ruby. Borax produces the same phenomena, but more rarely; and in all cases the slightest variation in the management of the fire will make the experiment fail entirely.

62
Ruby colour from
copper.

The ruby colour may also be produced by copper; whence a doubt may arise, whether it be the gold or the remains of the copper that produces this effect. Mr Bergman thinks it probable that both may contribute towards it, especially as copper is often found to contain gold.

63
Of golden
pyrites.

This precious metal cannot directly be mineralized by sulphur; but by the medium of iron is sometimes formed into a golden pyrites. Here, however, the quantity of gold is so small, that a globule can scarcely be extracted from it by the blow-pipe.

64
Of platina.

Grains of native platina are not affected by the blow-pipe, either alone or mixed with fluxes; which, however, are frequently tinged green by it: but platina, precipitated from aqua regia by vegetable or volatile alkali, is reduced by microcosmic salt to a small malleable globule. Our author has been able to unite

seven or eight of these into a malleable mass; but more of them produced only a brittle one. Platina scarcely loses all its iron unless reduced to very thin fusion.

65
Of silver in
its metallic
state.

Silver in its metallic state easily melts, and resists calcination. Silver leaf fastened by means of the breath, or a solution of borax, may easily be fixed on it by the flame, and through the glass it appears of a gold colour; but care must be taken not to crack the glass. Calcined silver precipitated from nitrous acid by fixed alkali is easily reduced. The microcosmic acid dissolves it speedily and copiously; but, on cooling, it becomes opaque and of a whitish yellow, which is also sometimes the case with leaf-silver. Copper is discovered by a green colour, and sometimes by that of a ruby, unless we choose rather to impute that to gold. The globules can scarcely be obtained pellucid, unless the quantity of calx be very small; but a longer fusion is necessary to produce an opacity with borax. The globule, loaded with dissolved silver during the time of its fusion in the spoon, covers a piece of copper with silver, and becomes itself of a pellucid green: antimony quickly takes away the milky opacity of dissolved luna cornea, and separates the silver in distinct grains. Cobalt and most of the other metals likewise precipitate silver on the same principles as in the moist way, viz. by a double elective attraction. The metal to be dissolved remains untouched as long as it retains its phlogiston; but is taken up when a sufficient quantity of that principle has shifted to the precipitate and reduced it. This metal, when mineralized by marine and vitriolic acids, yields a natural luna cornea, which produces a number of small metallic globules on the charcoal: it dissolves in microcosmic salt, and renders it opaque; and is reduced, partially at least, by borax. Sulphurated silver, called also the glassy ore of that metal, fused upon charcoal, easily parts with the sulphur it contains; so that a polished globule is often produced, which, if necessary, may be depurated by borax. The silver may also be precipitated by the addition of copper, iron, or manganese. When arsenic makes part of the compound, as in the red ore of arsenic, it must first be freed from the sulphur by gentle roasting, and finally entirely depurated by borax. It decrepitates in the fire at first.

66
Mineralized by various
substances.

Copper, together with sulphur and arsenic mixed with silver, called the white ore of silver, yields a regulus having the same alloy.

Galena, which is an ore of lead containing sulphur and silver, is to be freed in the same manner from the sulphur; after which the lead is gradually dissipated by alternately melting and cooling, or is separated in a cupel from the galena by means of the flame. Our author has not been able to precipitate the silver distinct from the lead, but the whole mass becomes malleable; and the same is true of tin, but the mass becomes more brittle.

67
Of mercury.

Pure mercury flies off from the charcoal with a moderate heat, the fixed heterogeneous matters remaining behind. When calcined it is easily reduced and dissipated, and the fluxes take it up with effervescence; but it is soon totally driven off. When mineralized by sulphur it liquefies upon the charcoal, burns with a blue flame, smokes, and gradually disappears; but on exposing,

Blow-pipe

exposing cinnabar to the fire on a polished piece of copper, the mercurial globules are fixed upon it all round.

68

Lead in its metallic state.

Lead, in its metallic state, readily melts, and continues to retain a metallic splendor for some time. By a more intense heat it boils and smokes, forming a yellow circle upon the charcoal. It communicates a yellow colour, scarce visible, to the fluxes; and when the quantity is large, the globule, on cooling, contracts more or less of a white opacity. It is not precipitated by copper when dissolved; nor do the metals precipitate it from sulphur in the same order as from the acids. When united to aerial acid, it grows red on the first touch of the flame: when the heat is increased, it melts, and is reduced to a multitude of small globules. When united with phosphoric acid, it melts and yields an opaque globule, but is not reduced. With fluxes it shows the same appearances as calx of lead. When mineralized by sulphur, lead easily liquefies, and, being gradually deprived of the volatile part, yields a distinct regulus, unless too much loaded with iron. It may be precipitated by iron and copper.

69

Mineralized by different substances.

A small piece of copper, either solid or foliated, sometimes communicates a ruby colour to fluxes, especially when assisted by tin or turbith mineral. If the copper be a little more or further calcined, it produces a green pellucid globule, the tinge of which grows weaker by cooling, and even verges towards a blue. By long fusion with borax, the colour is totally destroyed upon charcoal, but scarcely in the spoon. When once destroyed, this colour can scarcely be reproduced by nitre; but it remains fixed with microcosmic salt. If the calx or metal to be calcined be added in considerable quantity during fusion, it acquires an opaque red on cooling, though it appears green while pellucid and fused; but by a still larger quantity it contracts an opacity even while in fusion, and, upon cooling, a metallic splendor. Even when the quantity of copper is so small as scarcely to tinge the flux, a visible pellicle is precipitated upon a piece of polished iron added to it during strong fusion, and the globule in its turn takes the colour of polished iron; and in this way the smallest portions of copper may be discovered. The globule made green by copper, when fused in the spoon with a small portion of tin, yields a spherule of the latter mixed with copper, very hard and brittle: in this case the precipitated metal pervades the whole of the mass, and does not adhere to the surface. Cobalt precipitates the calx of copper dissolved in the spoon by a flux, in a metallic form, and imparts its own colour to glass, which nickel cannot do. Zinc also precipitates it separately, and rarely upon its own surface, as we can scarcely avoid melting it. When mineralized by the aerial acid, copper grows black on the first contact of the flame, and melts in the spoon; on the charcoal, the lower part, which touches the support, is reduced. With a superabundance of marine acid, it tinges the flame of a beautiful colour; but with a small quantity shows no appearance of the metal in that way. Thus the beautiful crystals of Saxony, which are cubic, and of a deep green, do not tinge the flame, though they impart a pellucid greenness to microcosmic salt. An opaque redness is easily obtained with borax; but Mr Bergman could not produce this colour with microcosmic salt. Copper

71

Mineralized.

simply sulphurated, when cautiously and gently roasted by the exterior flame, yields at last, by fusion, a regulus surrounded with a sulphurated crust. The mass roasted with borax separates the regulus more quickly.

If a small quantity of iron happens to be present, the piece to be examined must first be roasted; after which it must be dissolved in borax, and tin added to precipitate the copper. The regulus may also be obtained by sufficient calcination and fusion, even without any precipitant, unless the ore be very poor. When the pyrites contain copper, even in the quantity of the one-hundredth part of their weight, its presence may be detected by these experiments: Let a grain of pyrites of the size of a flax-seed, be roasted, but not so much as to expel all the sulphur; let it then be dissolved by borax, a polished rod of iron added, and the fusion continued until the surface when cooled loses all splendor. As much borax is required as will make the whole of the size of a grain of hemp-seed. Slow fusion is injurious, and the precipitation is also retarded by too great tenuity; but this may be corrected by the addition of a little lime. Too much calcination is also inconvenient; for by this the globule forms slowly, is somewhat spread, becomes knotty when warm, corrodes the charcoal, destroys the iron, and the copper does not precipitate distinctly. This defect is corrected by a small portion of crude ore. When the globule is properly melted, according to the directions already given, it ought to be thrown into cold water, immediately on stopping the blast, in order to break it suddenly. If the copper contained in it be less than one-hundredth part, one end of the wire only has a cupreous appearance, but otherwise the whole.

Dr Gahn has another method of examining the ores of copper; namely, by exposing a grain of the ore, well freed from sulphur by calcination, to the action of the flame driven suddenly upon it by intervals. At those instants a cupreous splendor appears on the surface, which otherwise is black; and this splendor is more quickly produced in proportion as the ore is poorer. The flame is tinged green by cupreous pyrites on roasting.

Forged iron is calcined, but can scarcely be melted; and liquefies on being fused. It cannot be melted by borax, though it may by microcosmic salt; and then it becomes brittle. Calcined iron becomes magnetic by being heated on the charcoal, but melts in the spoon. The fluxes become green by this metal; but in proportion as the phlogiston is more deficient they grow more of a brownish yellow. On cooling, the tinge is much weakened; and, when originally weak, vanishes entirely. By too much saturation the globule becomes black and opaque. The sulphureous pyrites may be collected into a globule by fusion, and is first surrounded by a blue flame; but as the metal is easily calcined, and changes into black scoriae, neither by itself nor with fluxes does it exhibit a regulus. It grows red on roasting.

Tin easily melts before the blow-pipe, and is calcined. The fluxes dissolve the calx sparingly; and, when saturated, contract a milky opacity. Some small particles of this metal dissolved in any flux may be distinctly precipitated upon iron. Crystallized ore of tin, urged by fire upon the charcoal, yields its metal in a reguline state.

72
Gahn's method of examining the ores of copper.

73
Of iron.

74
Of tin.

Bisnuth

Blow-pipe.

75
Bismuth.

Bismuth presents nearly the same appearances as lead; the calx is reduced on the coal, and fused in the spoon. The calx, dissolved in microcosmic salt, yields a brownish yellow globule, which grows more pale upon cooling, at the same time losing some of its transparency. Too much calx renders the matter perfectly opaque. Borax produces a similar mass in the spoon; but on the coal a grey one, which can scarcely be freed from bubbles. On fusion the glass smokes and forms a cloud about it. Bismuth is easily precipitated by copper and iron.

76
Combined
with sulphur.

Sulphurated bismuth is easily fused, exhibiting a blue flame and sulphureous smell. Cobalt, when added, by means of the sulphur, enters the globule; but the scoria soon swells into distinct partitions: which when further urged by fire, throws out globules of bismuth. Sulphurated bismuth, by the addition of borax, may be distinctly precipitated by iron or manganese.

77
Nickel.

Regulus of nickel when melted is calcined, but more slowly than other metals. The calx imports an hyacinthine colour to fluxes, which grows yellow on cooling, and by long continued fire may be destroyed. If the calx of nickel be contaminated by ochre of iron, the latter is first dissolved. Nickel dissolved is precipitated on iron, or even on copper; an evident proof that it does not originate from either of these metals. Sulphurated nickel is nowhere found without iron and arsenic: the regulus is obtained by roasting, and fusing with borax, though it still remains mixed with some other metals.

78
Arsenic.

Regulus of arsenic takes fire by a sudden heat, and not only deposits a white smoke on charcoal, but diffuses the same all around. The calx smokes with a smell of garlic, but does not burn. The fluxes grow yellow, without growing opaque, on adding a proper quantity of calx, which is dispelled by a long continuance of the heat. This semimetal is precipitated in a metallic form by iron and copper, but not by gold. Yellow arsenic liquefies, smokes, and totally evaporates: when heated by the external flame, so as neither to liquefy nor smoke, it grows red and yellow again upon cooling. When it only begins to melt it acquires a red colour, which remains after cooling. Realgar liquefies more easily, and is besides totally dissipated.

79
Cobalt.

Regulus of cobalt melts, and may partly be depurated by borax, as the iron is first calcined and taken up. The smallest portion of the calx tinges the flux of a deep blue colour, which appears of a violet by refraction, and this colour is very fixed in the fire. Cobalt is precipitated upon iron from the blue globule, but not upon copper. When calx of iron is mixed with that of cobalt in a flux, the former is dissolved. This semimetal takes up about one third of its weight of sulphur in fusion, after which it can hardly be melted again. It is precipitated by iron, copper, and several other metals. The common ore yields an impure regulus by roasting. The green cobalt, examined by our author, tinges the microcosmic salt blue; but at the same time shows red spots indicating copper.

80
Zinc.

Zinc exposed to the blow-pipe melts, takes fire, sending forth a beautiful bluish green flame, which however is soon extinguished by a lanuginous calx; but if the reguline nucleus included in this lanuginous matter (commonly called flowers of zinc) be urged by the flame, it will be now and then inflamed, and as it were

explodes and flies about. With borax it froths, and at first tinges the flame. It continually diminishes, and the flux spreads upon the charcoal; but in fused microcosmic salt it not only froths, but sends forth flashes with a crackling noise. Too great heat makes it explode with the emission of ignited particles. The white calx, or flowers, exposed to the flame on charcoal, becomes yellowish, and has a kind of splendor, which vanishes when the flame ceases. It remains fixed, and cannot be melted. The fluxes are scarcely tinged; but when saturated by fusion, grow opaque and white on cooling. Clouds are formed round the globules of a nature similar to that of the metallic calx. Dissolved zinc is not precipitated by any other metal. When mineralized by aerial acid, it has the same properties as calcined zinc. In the pseudo-galena sulphur and iron are present. These generally, on the charcoal, smell of sulphur, melt, and tinge the flame more or less, depositing a cloud all around. Those which have no matrix are tinged by those which contain iron, and acquire by saturation a white opaque colour, verging to brown or black, according to the variety of composition.

Blow-pipe
Blowing.

Regulus of antimony fused and ignited on the charcoal, affords a beautiful object; for if the blast of air be suddenly stopped, a thick white smoke rises perpendicularly, while the lower part round the globule is condensed into crystalline spiculæ, similar to those called *Argentine flowers*. The calx tinges fluxes of an hyacinthine colour; but on fusion smokes, and is easily dissipated, especially on the charcoal, though it also deposits a cloud on it. The dissolved metal may be precipitated by iron and copper, but not by gold. Crude antimony liquefies on the charcoal, spreads, smokes, penetrates it, and at last disappears entirely except a ring which it leaves behind.

81
Antimony.

Regulus of manganese scarcely yields to the flame. The black calx tinges the fluxes of a bluish colour; borax, unless saturated, communicates more of a yellow colour. The colour may be gradually dissolved altogether by the interior flame, and again reproduced by a small particle of nitre, or the exterior flame alone. Combined with aerial acid, it is of a white colour, which changes by ignition to black. In other respects it shows the same experiments as the black calx.

82
Manganese.

BLOWING, in a general sense, denotes an agitation of the air, whether performed with a pair of bellows, the mouth, a tube, or the like. Butchers have a practice of blowing up veal, especially the loins, as soon as killed, with a pipe made of a sheep's shank, to make it look larger and fairer.

BLOWING of Glass, one of the methods of forming the various kinds of works in the glass manufacture. It is performed by dipping the point of an iron blowing pipe in the melted glass, and blowing through it with the mouth, according to the circumstances of the glass to be blown. See **GLASS**.

BLOWING of Tin, denotes the melting its ore, after being first burnt to destroy the mundic.

Machines for BLOWING the Air into Furnaces. See the article **FURNACE**.

BLOWING, among gardeners, denotes the action of flowers, whereby they open and display their leaves. In which sense, blowing amounts to much the same with flowering or blossoming.

T t

The

Blubber,
Blue.

The regular blowing season is in the spring; though some plants have other extraordinary times and manners of blowing, as the Glastenbury thorn. Divers flowers also, as the tulip, close every evening, and blow again in the morning. Annual plants blow sooner or later as their seeds are put in the ground; whence the curious in gardening sow some every month in summer, to have a constant succession of flowers. The blowing of roses may be retarded by shearing off the buds as they put forth.

BLUBBER, denotes the fat of whales and other large sea-animals, whereof is made train-oil. It is properly the *adeps* of the animal: it lies immediately under the skin, and over the muscular flesh. In the porpoise it is firm and full of fibres, and invests the body about an inch thick. In the whale, its thickness is ordinarily six inches; but about the under lip, it is found two or three feet thick. The whole quantity yielded by one of these animals ordinarily amounts to 40 or 50, sometimes to 80 or more, hundred weight. The use of blubber to the animal seems to be partly to poise the body, and render it equiponderant to the water; partly to keep off the water at some distance from the blood, the immediate contact whereof would be apt to chill it; and partly also for the same use that clothes serve us, to keep the fish warm, by reflecting or reverberating the hot steams of the body, and so redoubling the heat; since all fat bodies are, by experience, found less sensible of the impressions of cold than lean ones. Its use in trade and manufactures is to furnish train-oil, which it does by boiling down. Formerly this was performed ashore in the country where the whales were caught: but of late the fishers do not go ashore; they bring the blubber home stowed in casks, and boil it down here.

Sea-BLUBBER. See MEDUSA.

BLUE, one of the seven colours into which the rays of light divide themselves when refracted through a glass prism. For an account of the particular structure of bodies by which they appear of a blue colour, see the article CHROMATICS.—The principal blues used in painting are Prussian blue, bice, Saunders blue, azure, or smalt, verditer, &c.; for the preparation of which, see COLOUR-Making.—In dyeing, the principal ingredients for giving a blue colour, are indigo and woad. See DYEING.

BLUE Colour of the Sky. See SKY.

BLUE Bird. See MOTACILLA.

BLUE Fish. See CORYPHENA.

BLUE Japan. Take gum-water, what quantity you please, and white-lead a sufficient quantity; grind them well upon a porphyry: then take isinglass size what quantity you please, of the finest and best smalt a sufficient quantity; mix them well: to which add, of your white-lead, before ground, so much as may give it a sufficient body. Mix all these together to the consistence of a point.

BLUR-John, among miners, a kind of mineral which has lately been fabricated into vases and other ornamental figures. It is of the same quality with the cubical spar, with respect to its fusibility in the fire. It loses its colour, and becomes white in a moderate heat: the weight of a cubic foot of the bluest kind is 3180 ounces, and that of the least blue is 3140 ounces. This substance began first to be applied to use about 18

years ago at one of the oldest mines in Derbyshire, called *Odin mine*, probably from its being dedicated to Odin the great god of the northern nations, at the foot of a high mountain called *Mam-Tor* in Castleton. Here the greatest quantities are still found; the largest pieces are sold for 9 l. a ton, the middle-sized for 6 l. and the least for 50 s.

Prussian BLUE. See CHEMISTRY-Index.

BLUING, the act or art of communicating a blue colour to bodies otherwise destitute thereof. Landresses blue their linen with smalt; dyers their stuffs and wools with woad or indigo.

BLUING of Metals is performed by heating them in the fire till they assume a blue colour; particularly practised by gilders, who blue their metals before they apply the gold and silver leaf.

BLUING of Iron, a method of beautifying that metal sometimes practised; as for mourning buckles, swords, and the like. The manner is thus: Take a piece of grind-stone or whet-stone, and rub hard on the work, to take off the black scurf from it: then heat it in the fire; and as it grows hot, the colour changes by degrees, coming first to light, then to a darker gold colour, and lastly to a blue. Sometimes also they grind indigo and fallad-oil together; and rub the mixture on the work with a woollen rag, while it is heating, leaving it to cool of itself. Among sculptors we also find mention of bluing a figure of bronze, by which it is meant the heating of it, to prepare it for the application of gold-leaf, because of the bluish cast it acquires in the operation.

BLUFF-HEAD, among sailors. A ship is said to be bluff-headed that has an upright stern.

BLUNDERBUSS, a short fire-arm with a wide-bore, capable of holding a number of bullets at once.

BLUSHING, a suffusion or redness of the cheeks, excited by a sense of shame, on account of consciousness of some failing or imperfection.

Blushing is supposed to be produced from a kind of consent or sympathy between several parts of the body, occasioned by the same nerve being extended to them all. Thus the fifth pair of nerves being branched from the brain to the eye, ear, muscles of the lips, cheeks, palate, tongue, and nose; a thing seen or heard that is shameful, affects the cheeks with blushes, driving the blood into the minute vessels thereof, at the same time that it affects the eye and ear. For the same reason it is, as Mr Derham observes, that a savoury thing seen or smelt affects the glands and parts of the mouth: if a thing heard be pleasing, it affects the muscles of the face with laughter: if melancholy, it exerts itself on the glands of the eyes, and occasions weeping, &c. And to the same cause Dr Willis ascribes the pleasure of kissing.

BOA, or *BOAE-arum*, (anc. geog.); an island on the coast of Illyricum over against Tragurium. A place of banishment for condemned persons; now called *Bua*, an island in the Adriatic, joined to the continent and to Tragurium, now *Tran*, by a bridge.

BOA, in zoology, a genus of serpents, belonging to the order of amphibia. The characters of this genus are, that the belly and tail are both furnished with scuta. The species are ten, viz. 1. The contortrix, has 150 scuta on the belly, and 40 on the tail: the head is broad, very convex, and has poison-bags in the

Bluing
||
Boa.

Boa.

the mouth, but no fang, for which reason its bite is not reckoned poisonous: the body is ash-coloured, interspersed with large dusky spots; and the tail is about a third of the length of the body. This serpent is found in Carolina. 2. The canina, has 203 scuta on the belly, and 77 on the tail; it is greenish and variegated with white belts. It is a native of America, and lodges in the hollow trunks of trees, and is about two feet long. The bite of the canina is not poisonous. 3. The hipnale is of a dull yellow colour, and is found in Asia. It has 179 scuta on the belly, and 120 on the tail. 4. The constrictor, has 240 scuta on the belly, and 60 on the tail. This is an immense animal; it often exceeds 36 feet in length; the body is very thick, of a dusky white colour, and its back is interspersed with 24 large pale irregular spots; the tail is of a darker colour; and the sides are beautifully variegated with pale spots. Besides, the whole body is interspersed with small brown spots. The head is covered with small scales, and has no broad laminae betwixt the eyes, but has a black belt behind the eyes. It wants the large dog-fangs, and of course its bite is not poisonous. The tongue is fleshy, and very little forked. Above the eyes, on each side, the head rises high. The scales of this serpent are all very small, roundish, and smooth. The tail does not exceed one eighth of the whole length of the animal. The Indians, who adore this monstrous animal, use the skin for cloaths, on account of its smoothness and beauty. There are several of these skins of the above dimensions preserved, and to be seen in the different museums of Europe, particularly in the library and botanic garden of Upsal in Sweden, which has of late been greatly enriched by count Grillinborg. The flesh of this serpent is eat by the Indians and the negroes of Africa. Piso, Margraave, and Kempfer, give the following account of its method of living and catching its prey. It frequents caves and thick forests, where it conceals itself, and suddenly darts out upon strangers, wild beasts, &c. When it chooses a tree for its watching place, it supports itself by twisting its tail round the trunk or a branch, and darts down upon sheep, goats, tigers, or any animal that comes within its reach. When it lays hold of animals, especially any of the larger kinds, it twists itself several times round their body, and by the vast force of its circular muscles bruises and breaks all their bones. After the bones are broke, it licks the skin of the animal all over, besmearing it with a glutinous kind of saliva. This operation is intended to facilitate deglutition, and is a preparation for swallowing the whole animal. If it be a stag, or any horned animal, it begins to swallow the feet first, and gradually sucks in the body, and last of all the head. When the horns happen to be large, this serpent has been observed to go about for a long time with the horns of a stag sticking out from its mouth. As the animal digests, the horns putrify and fall off. After this serpent has swallowed a stag or a tiger, it is unable for some days to move; the hunters, who are well acquainted with this circumstance, always take this opportunity of destroying it. When irritated, it makes a loud hissing noise. This serpent is said to cover itself over with leaves in such places as stags or other animals frequent, in order to conceal itself from their sight, and that it may the more easily lay hold of them. 5. The murina, has 254

scuta on the belly, and 65 on the tail. The colour of it is a light blue, with round spots on the back. It is a native of America, and its bite is not poisonous. 6. The scytale, has 250 scuta on the belly, and 70 on the tail. The body is ash-coloured and bluish, with round black spots on the back, and black lateral rings edged with white. This serpent is a native of America; and, like the constrictor, though not so long, twists itself about sheep, goats, &c. and swallows them whole. 7. The cenchria, has 265 scuta on the belly, and 57 on the tail. It is of a yellow colour, with white eye-like spots. It is a native of Surinam, and its bite is not poisonous. 8. The ophrias, has 281 scuta on the belly, and 64 on the tail; the colour is nearly the same with that of the constrictor, but browner. The place where this serpent is to be found is not known; but its bite is not venomous. 9. The enydris, has 270 scuta on the belly, and 105 on the tail. The colour is a dusky white, and the teeth of the lower jaw are very long; but its bite is not poisonous. It is a native of America. 10. The hortulana, has 290 scuta on the belly, and 128 on the tail. It is of a pale colour, interspersed with livid wedge-like spots. It is a native of America, and its bite is not poisonous. See SERPENT.

BOADADA BASHEE, in the Turkish military orders, an officer of the janizaries whose business it is to walk every day about the principal parts of the city, with a number of janizaries to attend him, to keep order, and see that all things are regular, even to the dress. This office is for three months, and from this the person is usually advanced to be a serach.

BOADICEA, a valiant British queen in the time of Nero the emperor, wife to Prasutagus king of the Iceni in Britain, who by his will left the emperor and his own daughters co-heirs to his great treasures, in expectation of procuring by that means Nero's protection for his family and people: but he was no sooner dead, than the emperor's officers seized all. Boadicea opposed these unjust proceedings; which was resented to such a pitch of brutality, that they ordered the lady to be publicly whipped, and her daughters to be ravished by the soldiers. The Britons took arms, with Boadicea at their head, to shake off the Roman yoke; and made a general and bloody massacre of the Romans in all parts. The whole province of Britain would have been lost, if Suetonius Paulinus had not hastened from the isle of Mona to London, and with 10,000 men engaged the Britains. The battle was fought for a long time with great vigour and doubtful success, till at last victory inclined to the Romans. Boadicea, who had behaved with all bravery imaginable, dispatched herself by poison.

BOAR, in the manege. A horse is said to boar when he shoots out his nose as high as his ears, and tosses his nose in the wind.

BOAR, a male swine. See SUS.

The wild boar, among huntsmen, has several names, according to its different ages: the first year, it is called a *pig of the faunder*; the second it is called a *bog*; the third, a *bog-steer*; and the fourth, a *boar*; when leaving the faunder, he is called a *singler* or *sangler*. The boar generally lives to 25 or 30 years, if he escapes accidents. The time of going to rut is in December, and lasts about three weeks. They feed on all sorts of

T t 2

fruits,

Boadada

||
Boar.

Boar.

fruits, and on the roots of many plants; the root of fern in particular seems a great favourite with them; and when they frequent places near the sea-coasts, they will descend to the shores and demolish the tenderer shell-fish in very great numbers. Their general places of rest are among the thickest bushes that can be found: and they are not easily put up out of them, but will stand the bay a long time. In April and May they sleep more sound than at any other time of the year, and this is therefore the successful time for the taking them in the toils. When a boar is roused out of the thicket, he always goes from it, if possible, the same way by which he came to it; and when he is once up, he will never stop till he comes to some place of more security. If it happens that a faunder of them are found together, when any one breaks away, the rest all follow the same way. When the boar is hunted in the wood where he was bred, he will scarce ever be brought to quit it; he will sometimes make towards the sides to listen to the noise of the dogs, but retires into the middle again, and usually dies or escapes there. When it happens that a boar runs a-head, he will not be stopped or put out of his way, by man or beast, so long as he has any strength left. He makes no doubles nor crossings when chased; and when killed makes no noise, if an old boar; the sows and pigs will squeak when wounded.

The season for hunting the wild boar begins in September, and ends in December, when they go to rut. If it be a large boar, and one that has lain long at rest, he must be hunted with a great number of dogs, and those such as will keep close to him; and the huntsman, with his spear, should always be riding in among them, and charging the boar as often as he can, to discourage him: such a boar as this, with five or six couple of dogs, will run to the first convenient place of shelter, and there stand at bay and make at them as they attempt to come up with him. There ought always to be relays also set of the best and staunchest hounds in the kennel; for if they are of young eager dogs, they will be apt to seize him, and be killed or spoiled before the rest come up. The putting collars with bells about the dogs necks is a great security for them; for the boar will not so soon strike at them when they have these, but will rather run before them. The huntsmen generally kill the boar with their swords or spears: but great caution is necessary in making the blows; for he is very apt to catch them upon his snout or tusks; and if wounded and not killed, he will attack the huntsman in the most furious manner. The places to give the wound with the spear is either between the eyes in the middle of the forehead, or in the shoulder; both these places make the wound mortal.

When this creature makes at the hunter, there is nothing for it but courage and address; if he flies for it, he is surely overtaken and killed. If the boar comes straight up, he is to be received at the point of the spear: but if he makes doubles and windings, he is to be watched very cautiously, for he will attempt getting hold of the spear in his mouth; and if he does so, nothing can save the huntsman but another person attacking him behind; he will on this attack the second person, and the first must then attack him again: two people will thus have enough to do with him; and were

it not for the forks of the boar-spears that make it impossible to press forward upon them, the huntsman who gives the creature his death's wound, would seldom escape falling a sacrifice to his revenge for it. The modern way of boar-hunting is generally to dispatch the creature by all the huntsmen striking him at once: but the ancient Roman way was, for a person on foot, armed with a spear, to keep the creature at bay; and in this case the boar would run of himself upon the spear to come at the huntsman, and push forward till the spear pierced him through.

The hinder claws of a boar are called *guards*. In the corn, he is said to *feed*; in the meadows or fallow-fields, to *root*, *worm*, or *fern*; in a close, to *graze*. The boar is farrowed with as many teeth as he will ever have; his teeth increasing only in bigness, not in number: among these there are four called *tushes*, or *tusks*; the two biggest of which do not hurt when he strikes, but serve only to whet the other two lowest, with which the beast defends himself, and frequently kills, as being greater and longer than the rest.

It is very remarkable, that these creatures in the West Indies are subject to the stone; few of them are absolutely free from it, yet scarce any have the stones of any considerable size. It is common to find a great number in the same bladder; and they are usually of about a scruple weight, and are angular, and that with great regularity, each having five angles.

Among the ancient Romans boar's flesh was a delicacy; a boar served up whole was a dish of state.

The boar was sometimes also the military ensign borne by the Roman armies, in lieu of the eagle.

Among physicians, a boar's bladder has been reputed a specific for the epilepsy. The tush of the wild boar still passes with some as of great efficacy in quin-zies and pleurifies.

BOARD, a long piece of timber, sawed thin for building and several other purposes. See TIMBER.

Deal-boards are generally imported into England ready sawed, because done cheaper abroad, in regard we want saw-mills. Cap-boards are imported from Sweden and Dantzic. Oak-boards chiefly from Sweden and Holland; some from Dantzic. We also import white boards for shoe-makers; mill and scale-boards, &c. for divers artificers. Scale-board is a thinner sort, used for the covers of primers, thin boxes, and the like. It is made with large planes; but might probably be sawed with mills to advantage.

BOARD is also used for a kind of table or bench, whereon several artificers perform their work. In this sense we say a work-board, shop-board, taylor's-board, &c.

BOARD is also used for a flat machine, or frame, used in certain games, and the like. In this sense, we say a draught-board, a chess-board, a shovel-board, and the like.

BOARD, *Bureau*, is also used for an office where accounts are taken, payments ordered, and the like. In this sense, we say the board of works, board of ordinance, board of treasury, and the like.

BOARD, among seamen. *To go aboard*, signifies to go into the ship. *To slip by the board*, is to slip down by the ship's side. *Board and board*, is when two ships come so near as to touch one another, or when they lie side by side. *To make a board*, is to turn to wind-ward;

Boar,
Board.

Plate C.

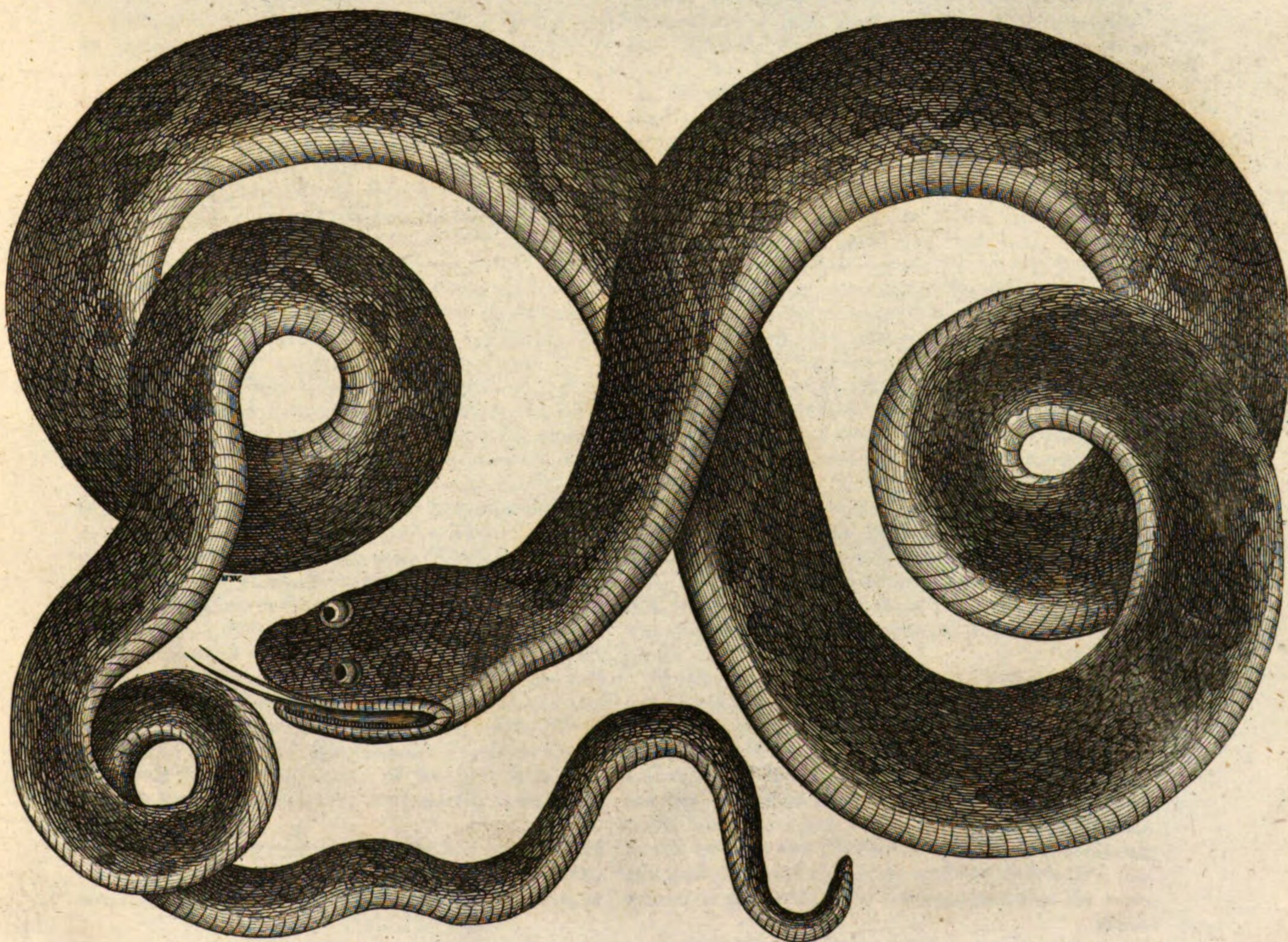
Bos, sp. 5.



Bos, sp. 4a.



Boa Constrictor.



A. Bell, Pin. Wal. Sculptor fecit.

Boarding.
Boat.

ward; and the longer your boards are, the more you work into the wind. *To board it up*, is to beat it up, sometimes upon one tack and sometimes upon another. *She makes a good board*, that is, the ship advances much at one tack. *The weather-board*, is that side of the ship which is to windward.

BOARDING, in a naval engagement, a desperate and furious assault made by one ship on another, after having found every other method to reduce her ineffectual: it may be performed in different places of the ship, according to their circumstances and situation, by the assailant detaching a number of men armed with pistols and cutlasses on the decks of his antagonist, who stands in the same predicament with a city stormed by the besiegers. This expedient, however, is rarely attempted by king's ships, which generally decide the combat without grappling each other: but chiefly practised by privateers, which, bearing down on the enemy's quarter or broadside, drop from the bowsprit, which projects over the defendant's deck, an earthen shell, called a *slink-pot*, charged with fiery and suffocating combustibles, which immediately bursts, catches fire, and fills the deck with insufferable stench and smoke: in the middle of the confusion thus occasioned, the privateer's crew rush aboard, under cover of the smoke, and easily overpower the astonished enemy, unless they have close quarters to which they can retreat and beat them off the deck.

BOAT, a small open vessel, conducted on the water by rowing or sailing. The construction, machinery, and even the names of boats, are very different, according to the various purposes for which they are calculated, and the services on which they are to be employed. Thus they are occasionally slight or strong, sharp or flat bottomed, open or decked, plain or ornamented; as they may be designed for swiftness or burden, for deep or shallow water, for sailing in a harbour or a sea, and for convenience or pleasure.

The largest boat that usually accompanies a ship is the *long-boat*, which is generally furnished with a mast and sails: those which are fitted for men of war, may be occasionally decked, armed, and equipped, for cruising short distances against merchant-ships of the enemy, or smugglers, or for impressing seamen, &c. The *barges* are next in order, which are longer, lighter, and narrower: they are employed to carry the principal sea-officers, as admirals, and captains of ships of war, and are very unfit for sea. *Pinnaces* exactly resemble barges, only that they are somewhat smaller, and never row more than eight oars; whereas a barge properly never rows less than ten. These are for the accommodation of the lieutenants, &c. *Cutters* of a ship, are broader, deeper, and shorter, than the barges and pinnaces; they are fitter for sailing, and are commonly employed in carrying stores, provisions, passengers, &c. to and from the ship. In the structure of this sort of boats, the lower edge of every plank in the side overlays the upper edge of the plank below, which is called by shipwrights *clinch-work*. *Yawls* are something less than cutters, nearly of the same form, and used for similar services; they are generally rowed with six oars.

The above boats more particularly belong to men of war; as merchant-ships seldom have more than two, viz. a long-boat and yawl: when they have a third, it

is generally calculated for the countries to which they trade, and varies in its construction accordingly. Merchant-ships employed in the Mediterranean find it more convenient to use a *lanch*, which is longer, more flat-bottomed, and better adapted every way to the harbours of that sea, than a long-boat.

A *wherry* is a light sharp boat, used in a river or harbour for carrying passengers from place to place. *Punts* are a sort of oblong flat-bottomed boats, nearly resembling floating stages; they are used by shipwrights and caulkers, for breaming, caulking, or repairing a ship's bottom. A *moses* is a very flat broad boat, used by merchant-ships amongst the Caribbee-islands, to bring hogheads of sugar off from the sea-beach to the shipping which are anchored in the roads. A *felucca* is a strong passage-boat used in the Mediterranean, from 10 to 16 banks of oars. The natives of Barbary often employ boats of this sort as cruisers.

For the larger sort of boats, see the articles CRAFT, CUTTER, PERIAGUA, and SHALLOP.

Of all the small boats, a *Norway yawl* seems to be the best calculated for a high sea, as it will often venture out to a great distance from the coast of that country, when a stout ship can hardly carry any sail.

An account of several trials made on a BOAT, or Sloop, fit for inland navigation, coasting voyages, and short passages by sea, which is not, like ordinary vessels, liable to be overfet or sunk by winds, waves, water-spouts, or too heavy a load; contrived and constructed by Monsieur Bernieres, director of the bridges and causeways in France, &c. &c. Some of these trials were made on the first of August 1777, at the gate of the invalids in Paris, in the presence of the provost of the merchants, of the body of the town, and a numerous concourse of spectators of all conditions.

The experiments were made in the way of comparison with another common boat of the same place, and of equal size. Both boats had been built ten years, and their exterior forms appeared to be exactly similar. The common boat contained only eight men, who rocked it and made it incline so much to one side, that it presently filled with water, and sunk; so that the men were obliged to save themselves by swimming; a thing common in all vessels of the same kind, either from the imprudence of those who are in them, the strength of the waves or wind, a violent or unexpected shock, their being overloaded, or overpowered in any other way.

The same men who had just escaped from the boat which sunk, got into the boat of M. Bernieres; rocked it, and filled it, as they had done the other, with water. But, instead of sinking to the bottom, though brim-full, it bore being rowed about the river, loaded as it was with men and water, without any danger to the people in it.

M. Bernieres carried the trial still farther. He ordered a mast to be erected in this same boat, when filled with water; and to the top of the mast had a rope fastened, and drawn till the end of the mast touched the surface of the river, so that the boat was entirely on one side, a position into which neither winds nor waves could bring her; yet, as soon as the men who had hauled her into this situation let go the rope, the boat and mast recovered themselves perfectly in less than the quarter of a second; a convincing proof that the boat

could

Boat.

Boating
||
Bobbing.

could neither be sunk nor overturned, and that it afforded the greatest possible security in every way. These experiments appeared to give the greater pleasure to the public, as the advantages of the discovery are not only so sensible, but of the first importance to mankind.

Boat-Bill. See CANCROMA.

Boat-Insect. See NOTONECTA.

BOATING, a kind of punishment in use among the ancient Persians for capital offenders. The manner of boating was thus: the person condemned to it being laid on his back in a boat, and having his hands stretched out, and tied fast on each side of it, had another boat put over him, his head being left out thro' a place fit for it. In this posture they fed him, till the worms, which were bred in the excrements he voided as he thus lay, eat out his bowels, and so caused his death, which was usually twenty days in effecting, the criminal lying all this while in most exquisite torments.

BOATSWAIN, the officer who has the boats, sails, rigging, colours, anchors, and cables, committed to his charge.

It is the duty of the boatswain particularly to direct whatever relates to the rigging of a ship, after she is equipped from a royal dock-yard. Thus he is to observe that the masts are properly supported by their shrouds, stays, and back-stays, so that each of those ropes may sustain a proportional effort when the mast is strained by the violence of the wind, or the agitation of the ship. He ought also to take care that the blocks and running-ropes are regularly placed, so as to answer the purposes for which they are intended; and that the sails are properly fitted to their yards and stays, and well furled or reefed when occasion requires.

It is likewise his office to summon the crew to their duty; to assist with his mates in the necessary business of the ship; and to relieve the watch when it expires. He ought frequently to examine the condition of the masts, sails, and rigging: and remove whatever may be judged unfit for service, or supply what is deficient; and he is ordered by his instructions to perform this duty with as little noise as possible.

Boatswain's-Mate has the peculiar command of the long-boat, for the setting forth of anchors, weighing or fetching home an anchor, warping, towing, or mooring; and is to give an account of his store.

BOB, a term used for the ball of a short pendulum.

BOBARTIA, in botany: A genus of the digynia order, belonging to the triandria class of plants; and in the natural method ranking under the 4th order, *Gramina*. The calyx is imbricated; and the corolla is a bivalved glume, above the receptacle of the fruit. Of this genus there is only one species known, which is a native of the Indies, and hath no remarkable property.

BOBBIN, a small piece of wood turned in the form of a cylinder, with a little border jutting out at each end, bored through to receive a small iron pivot. It serves to spin with the spinning-wheel, or to wind thread, worsted, hair, cotton, silk, gold, and silver.

BOBBING, among fishermen, a particular manner of catching eels, different from sniggling. Bobbing for eels is thus performed: They scour well some large lobs, and with a needle run a twisted silk through them from end to end, taking so many as that they may warp them about a board a dozen times at least: then they

tie them fast with the two ends of the silk, that they may hang in so many hanks; which done, they fasten all to a strong cord, and, about an handful and an half above the worms, fix a plummet three-quarters of a pound weight, and make the cord fast to a strong pole. With this apparatus fishing in muddy water they feel the eels tug lustily at the bait; when they think they have swallowed it sufficiently, they gently draw up the rope to the top, and bring them ashore.

BOBIO, an episcopal town of Italy, in the Milanese and territory of Pavia, seated on the river Treba, in E. Long. 9. 30. N. Lat. 44. 48.

BOCA-CHICA, the strait or entrance into the harbour of Carthagena in South America. It is defended by several forts belonging to the Spaniards, all which were taken by the English in 1741; they were nevertheless obliged to raise the siege of Carthagena in a short time after.

Boca-del-Draco. a strait so called, between the island of Trinidad and Andalusia, in the province of Terra Firma in South America.

BOCANUM, (anc. geog.), a town of Mauritania Tingetana, to the south of mount Atlas; said to be that of Morocco in Africa. W. Long. 9. 0. N. Lat. 31. 0.

BOCCA, in glass-making, the round hole in the working furnace, by which the metal is taken out of the great pots, and by which the pots are put into the furnace. This is to be stopped with a cover made of earth and brick, and removeable at pleasure, to preserve the eyes of the workmen from the violence of the heat.

BOCCACE (John), one of the most polite and learned writers of his age, was born in Tuscany in 1313. His father first placed him with a merchant; but as he gave signs of genius, he was put afterward to study the canon law: he lost almost as much time at this as at the last occupation; and thought of nothing but poetry. He came under the instruction of Petrarch; but did not so entirely devote himself to poetry, as to forget other studies. In the prosecution of these, however, as he sought every where for the best masters, and had not an income sufficient for his expences, he was reduced to such circumstances as to stand in need of the bounty of others: he was particularly obliged to Petrarch, who furnished him with money as well as books, and assisted him in many other respects. Boccace was a great admirer of the Greek language: he found means to get Homer translated into Latin for his own use; and procured a professor's chair at Florence for Leontius Pylatus, in order to explain this poet. The republic of Florence honoured Boccace with the freedom of that city; and employed him in public affairs, particularly to negotiate the return of Petrarch: but this poet not only refused to return to Florence, but persuaded Boccace also to retire from thence, on account of the factions which prevailed in that republic. Having quitted Florence, he went to several places in Italy, and stopped at last at the court of Naples, where King Robert gave him a very kind reception. He conceived a violent affection for the natural daughter of that prince, which made him remain a considerable time at Naples. He also made a long stay in Sicily, where he was in high favour with Queen Joan. He returned to Florence when the troubles

Bobio
||
Boccace.

Boccale
||
Bocciardi.

troubles were a little appeased: but not liking the course of life he must have followed there, he retired to Certaldo; and, far from the noise of business, he spent his time in study agreeably to his own humour. His great application brought on him an indisposition, of which he died in 1376. He wrote several books, some learned and serious, others of gallantry and full of stories. It is by his *Decameron* chiefly that he has immortalized himself. Petrarch found so many charms in this composition, that he was at the pains to translate it into Latin for his own satisfaction.

BOCCALE, or BOCAL, a liquid measure used at Rome, answering to what among us is called a bottle, being equivalent to about an English quart. Seven boccales and an half make the rubbia.

BOCCALINI (Trajan), a celebrated satirical writer, born at Rome, who, in the beginning of the 17th century, obtained the admiration of all Italy by his refined and delicate criticisms. Sovereign princes themselves did not escape the lash of his satire. The cardinals Borghese and Gætan having declared themselves his protectors, he published his *Ragguaglio di Parnasso*, and *La Secretaria di Apollo*, which is the continuation of the former. These two works were received by the public with uncommon applause. He there feigns, that Apollo, holding his court at Parnassus, heard the complaints of the whole world, and did justice according as the cases required. He at length printed his *Pietra di Parangone*; wherein he attacks the court of Spain, setting forth their designs against the liberty of Italy, and inveighing particularly against them for the tyranny they exercised in the kingdom of Naples. The Spaniards complained of him in form, and were determined at any rate to be revenged. Boccalini was frightened, and retired to Venice; but was there assassinated in a very strange manner. He lodged with one of his friends, who having got up early one morning, left Boccalini in bed: a minute after, some armed men entered his chamber, and gave him so many blows with bags full of sand, that they left him for dead; so that his friend returning some time after, found him speechless. Great search was made at Venice for the authors of this murder; and though they were never discovered, it was universally believed that they were employed by the court of Spain.

BOCCARELLA, in the glass-manufacture, a small hole or aperture of the furnace, one of which is placed on each side the bocca, almost horizontally with it. Out of them the servitors take coloured or finer metal from the piling pot.

BOCCIARDI (Clemente), called *Clementone*, history and portrait painter, was born at Genoa in 1620, and was the disciple of Bernardo Strozzi, an artist of good reputation; but he found in himself so strong an ambition to arrive at excellence in his profession, that he left Genoa, and went to Rome; there, to explore that true sublimity of style, which can only be obtained by a judicious observation of the ancient sculptures and the works of the celebrated modern artists. By the guidance of an excellent genius, and also by a most industrious application to design, he discovered the art of uniting and blending the antique and modern gusto in a style that at once exhibited both gracefulness and strength. Most of the works of this master (except his portraits, which were lively, natural, and grace-

ful) are in the chapels of Genoa, Pisa, and other cities of Italy; of which places they are, at this day, accounted the greatest ornaments, and are most exceedingly esteemed.

BOCCONI (Sylvio), a celebrated natural historian, born at Palermo in Sicily. After he had gone through the usual course of studies, he applied himself chiefly to natural history, in which he made a most surprising progress. He was afterwards ordained priest, and entered into the Cistercian order, at which time he changed his christian name *Paul* into that of *Sylvio*. This new way of life did not in the least divert him from his favourite study: for he pursued it with greater vigour than ever, and travelled not only over Sicily, but likewise visited the isle of Malta, Italy, the Low Countries, England, France, Germany, Poland, and several other nations; and, in 1696, was admitted a member of the academy of the virtuosi in Germany. Upon his return to Sicily, he retired to a convent of his own order near Palermo; where he died in 1704, being 71 years of age. He left many curious works.

BOCCONIA, GREATER TREE CELANDINE: A genus of the monogynia order, belonging to the dodecandria class of plants; and in the natural method ranking under the 27th order, *Rhæadæ*. The calyx is diphyllous; there is no corolla; the stylus is bifid; the berry is dry, and monospermous. Of this genus there is but one known species, viz. the frutescens, which is esteemed for the beauty of its large foliage. It is very common in Jamaica and other warm parts of America, where it grows to the height of 10 or 12 feet, having a straight trunk as large as a man's arm, and covered with a white smooth bark. At the top it divides into several branches, on which the leaves are placed alternately. These leaves are eight or nine inches long, and five or six broad; are deeply sinuated, sometimes almost to the midrib; and are of a fine glaucous colour. The whole plant abounds with a yellow juice of an acrid nature; so that it is used by the inhabitants of America to take off warts and spots from the eyes. The singular beauty of this plant renders it worthy of a place in every curious collection: and it seems the Indians are very fond of it; for Hernandez tells us, their kings used to plant it in their gardens. It is propagated by seeds from America, sowing them in spring, in pots of light earth, which must be plunged in a hot-bed. When the plants come up, they are to be kept in separate pots, which must always be kept in a stove.

BOCHART (Samuel), one of the most learned men in the 17th century, was born at Roan in Normandy. He made a very early progress in learning, and became a great proficient in the oriental languages. He was many years pastor of a protestant church at Caen; where he was tutor to Wentworth Dillon earl of Roscommon, author of the *Essay on Translated Verse*. Here he particularly distinguished himself by his public disputations with father Veron, a very famous controversialist. The dispute was held in the castle of Caen, in the presence of a great number of Catholics and Protestants. Bochart came off with great honour and reputation; which were not a little increased in the year 1646, upon the publication of his *Phaleg* and *Canaan*, which are the titles of the two parts of his *Geographica Sacra*. He acquired also great fame by his *Hierozoicon*, printed in London in 1675. This treats *de animalibus sacra*

Bocconi
||
Bochart.

Bochius
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Bodin.

sacra scriptura. The great learning he displayed in his works rendered him esteemed not only amongst those of his own profession, but amongst all lovers of knowledge of whatever denomination. In 1652, the queen of Sweden invited him to Stockholm, where she gave him many proofs of her regard and esteem. At his return to Caen, he resumed the functions of the ministry, and was received into the academy of that city. His learning was not his principal qualification, he had a modesty equal to it; and hence enjoyed his great reputation in tranquillity, sheltered from those unhappy quarrels which so many other learned men draw upon themselves. He died suddenly while he was speaking in the above academy, on the 16th of May, 1667, aged 78. A complete edition of his works was published in Holland, in two volumes folio, 1712.

BOCHIIUS, or BOCQUY (John), a Latin poet, born at Brussels in 1555. He travelled into Italy, Germany, Poland, and Muscovy, and at his return became secretary to the Duke of Parma. He died on the 13th of January, 1609. The critics in the Netherlands set so great a value on his poetry, that they gave him the name of the *Belgic Virgil*. He wrote, 1. *De Belgii Principatu*. 2. *Parodia Heroica Psalmorum Davidicorum*. 3. *Observationes, Physicae, Ethicae, Politicae, et Historicae, in Psalmos*. 4. *Vita Davidis*. 5. *Orationes*. 6. *Poemata*.

BOCHETTA, a place of Italy, famous in the war of 1746 and 1747. It is a chain of mountains over which the great road lies from Lombardy to Genoa; and on the very peak of the highest mountain is a narrow pass, which will hardly admit three men to go abreast. This pass is properly called the *Bochetta*; for the defence of which there are three forts. It is the key of the city of Genoa; and was taken in 1746 by the Imperialists. By which means they opened a way to that city.

BOCKHOLT, a town of Germany in the circle of Westphalia and diocese of Munster, capital of a small district, and subject to the bishop of Munster. E. Long. 6. 20. N. Lat. 51. 40.

BOCKING, a very large village of Essex in England, adjoining to Brain-tree, from which it is separated only by a small stream. Its church is a deanery, and very large; and there are here two or three meeting-houses; but the market is kept at Brain-tree. In both parishes there are about 1500 houses, which in general are but indifferent, and the streets narrow and badly paved. There is a large manufactory of bays, chiefly for exportation. It is 42 miles north-east of London.

BOCK-LAND, in the Saxons time, is what we now call *freehold lands*, held by the better sort of persons by charter or deed in writing; by which name it was distinguished from *folkland* or copy-hold land, holden by the common people without writing.

BODERIA, or BODOTRIA, the ancient name for the Frith of Forth in Scotland.

BODIN (John), native of Angers, one of the ablest men in France in the 16th century, famous for his *Method of History*, his *Republic*, and other works. He was in great favour with Henry III. who imprisoned John de Serre for writing an injurious piece against Bodin, and forbid him upon pain of death to publish it. But his favour was not of long continuance. The

duke of Alençon, however, gave him several employments; and carried him to England with him as one of his counsellors, where he had the pleasure and glory to see his books *de Republica* read publicly in the university of Cambridge, having been translated into Latin by the English. He had written them in French. In the Ragguagli of Boccalini he is condemned as an atheist to the fire, for having said in his books that liberty of conscience ought to be granted to sectaries. He declared himself pretty freely against those who asserted that the authority of monarchs is unlimited; but yet he displeased the republicans. Upon the death of the duke of Alençon, Bodin retired to Laon, where he married. He had an office in the presidial of this city; and in Charles IX.'s time he was the king's solicitor with a commission for the forests of Normandy. He died of the plague at Laon, in 1596.

BODKIN, a small instrument made of steel, bone, ivory, &c. used for making holes.

BODLEY (Sir Thomas), founder of the Bodleian library at Oxford, was born at Exeter in Devonshire, in 1544. When he was about 12 years of age, his father, Mr John Bodley, being a protestant, was obliged to leave the kingdom. He settled at Geneva with his family, and continued there till the death of Queen Mary. In that university, then in its infancy, young Bodley studied the learned languages, &c. under several eminent professors. On the accession of Queen Elizabeth, he returned with his father to England; and was soon after entered of Magdalen college in Oxford. In 1563, he took the degree of bachelor of arts, and the year following was admitted fellow of Merton college. In 1565, he read a Greek lecture in the hall of that college. He took a master of arts degree the year after, and read natural philosophy in the public schools. In 1569, he was one of the proctors of the university, and for some time after, officiated as public orator. In the year 1576, he quitted Oxford, and made the tour of Europe; but returned to his college after four years absence. He became gentleman-usher to Queen Elizabeth, in the year 1583; and in 1585 he married the widow of Mr Ball, daughter of Mr Carew of Bristol, a lady of considerable fortune. Mr Bodley was soon after sent ambassador to the king of Denmark, and other German princes. He was next charged with an important commission to Henry III. of France; and in 1588, went ambassador to the United Provinces, where he continued till the year 1597. On his return to England, finding his preferment obstructed by the jarring interests of Burleigh and Essex, he retired from court, and could never afterwards be prevailed on to accept of any employment. He now began the foundation of the Bodleian library, which was completed in 1599. Soon after the accession of king James I. he received the honour of knighthood, and died in the year 1612. He was buried in the choir of Merton college. His monument is of black and white marble, on which stands his effigy in a scholar's gown, surrounded with books. At the four corners are the emblematical figures of Grammar, Rhetoric, Music, and Arithmetic; two angels, &c.; with a short inscription, signifying his age and time of his death. Sir Thomas Bodley was a polite scholar, an able statesman, and a worthy man. Mr Granger observes, that he merited much as a man of letters;

Bodkin,
Bodley.

Bodmin
||
Boece.

ters; but incomparably more in the ample provision he made for literature, in which he stands unrivalled; and that his library is a mausoleum which will perpetuate his memory as long as books themselves endure. Sir Thomas wrote his own Life to the year 1609; which, together with the first draught of the Statutes, and his Letters, have been published from the originals in the Bodleian library, by Mr Thomas Hearn, in 1703.

BODMIN, a town of Cornwall in England, seated in a bottom between two high hills, which renders the air very unwholesome. It consists chiefly of one street, and the many decayed houses show that it has once been a place of greater note. It is a mayor-town, sends two members to parliament, and had formerly the privilege of the coinage of tin. W. Long. 4. 5. N. Lat. 50. 32.

BODON, a fortified town of Bulgaria in Turkey in Europe, with an archbishop's see. It is seated on the Danube, in E. Long. 25. 24. N. Lat. 45. 10.

BODROCH, a town of Hungary, seated on the north-east shore of the river Danube, in E. Long. 20. 20. N. Lat. 46. 15.

BODRUN. See TEOS.

BODY, in physics, an extended solid substance, of itself utterly passive and inactive, indifferent either to motion or rest.

Colour of BODIES. See CHROMATICS.

BODY, with regard to animals, is used in opposition to soul, in which sense it makes the subject of anatomy. The height of the human body is said to be different in different parts of the day; ordinarily it is an inch more in the morning than at night†. The body ceases to grow in height when the bones are arrived at a degree of firmness and rigidity which will not allow of farther extension by the effort of the heart and motion of the blood.

BODY, among painters, as to *bear a body*, a term signifying that the colours are of such a nature, as to be capable of being ground so fine, and mixing with the oil so entirely, as to seem only a very thick oil of the same colour.

BODY, in the manege. A horse is chiefly said to have a *good body*, when he is full in the flank. If the last of the short ribs be at a considerable distance from the haunch-bone, although such horses may for a time have pretty good bodies, yet, if they are much laboured, they will lose them: and these are properly the horses that have no flank. It is also a general rule, that a man should not buy a light-bodied horse, and one that is fiery, because he will soon destroy himself.

BODY, in the art of war, a number of forces, horse and foot, united and marching under one commander.

Main Body of an army, the troops encamped in the centre between the two wings, and generally infantry; the other two bodies are the vanguard and the rear-guard; these being the three into which an army, ranged in order of battle, is divided.

BODY, in matters of literature, denotes much the same with system, being a collection of every thing belonging to a particular science or art, disposed in proper order: thus we say, a body of divinity, law, physic, &c.

Body-Corporate. See CORPORATION.

BOECE, or BOETHIUS (Hector), the historian, was
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Boedromia
||
Boehmen.

born at Dundee about the year 1470, and studied with applause in the university of Paris. It was there he became acquainted with Erasmus, and laid the foundation of a friendship which was so honourable to him. In 1500 he was recalled to Aberdeen by Bishop Elphinston, who made him principal of that university. Gratitude for this promotion engaged him to write with particular attention the Life of that prelate. It appeared in his history of the diocese of Aberdeen; and may be considered, perhaps, as the most valuable portion of that work. His History of Scotland, a more useful undertaking, was first published in the 1526. In 1574 it underwent a second impression, and was enriched with the 18th book and a part of the 19th. A farther continuation of it was executed by Joannes Ferrerius Pedemontanus. Boece died about the year 1550. He has been compared, and not without reason, to Geoffroy of Monmouth. He had a propensity to fable and exaggeration; a fault which the elegance of his expression does not compensate. His judgment was not equal to his genius; and his fictions as an historian are a contrast to his probity as a man. John Ballenden, archdeacon of Murray, translated his history into the Scottish language at the desire of James V. This translation William Harrison converted, though with imperfections, into English; and his associate Hollingshed published his work in his chronicle, with additions and improvements by the ingenious Francis Thynne.

BOEDROMIA, in antiquity, solemn feasts held at Athens in memory of the succour brought by Ion to the Athenians, when invaded by Eumolpus son of Neptune, in the reign of Erechtheus. Plutarch gives another account of the boedromia; which, according to him, were celebrated in memory of the victory obtained by Theseus over the Amazons, in the month Boedromion.

BOEDROMION, in chronology, the third month of the Athenian year, answering to the latter part of our August and beginning of September.

BOEHMEN (Jacob), called the *Teutonic philosopher*, was a noted visionary of the 17th century, born in a village of Germany near Gorlitz, in 1575. He was bred a shoemaker: and marrying, supported a large family by this occupation; until, after amusing himself with chemistry, a visionary turn of mind, heated by sermons and German divinity, got the upper hand of his common sense, and produced raptures and notions of divine illumination. These he first gave vent to in 1612, by a treatise intitled *Aurora, or the rising of the Sun*; being a mixture of astrology, philosophy, chemistry, and divinity, written in a quaint obscure style. This being censured by the magistrates of Gorlitz, he remained silent for seven years: but improving that interval by pursuing the flights of his imagination, he resumed his pen; and resolving to redeem the time he had lost, he, in the remaining five years of his life, published above 20 books, which greatly needed what he concluded with, *A table of his principles, or a key to his writings*; though this has not proved sufficient to render them intelligible to common apprehensions. The key above mentioned appeared in 1624, and he did not long survive it. For early in the morning of the 18th of November that year, he called one of his sons, and asked him "if he also heard that excellent music?"

Boeotia,
Boerhaave.

music?" to which being answered in the negative, he ordered the door to be set open, that the music might be the better heard. He asked afterwards what o'clock it was? and being told it had struck two, he said "It is not yet my time; my time is three hours hence." In the interim he was heard to speak these words: "O thou strong God of hosts, deliver me according to thy will! O thou crucified Lord Jesus, have mercy upon me, and receive me into thy kingdom!" When it was near six o'clock, he took his leave of his wife and sons, and blessed them, and said, "Now I go hence into paradise; then bidding his son turn him, he immediately expired his last breath in a deep sigh. A great number of persons have been inveigled by the visions of this fanatic, notwithstanding his talents in involving the plainest things in mystery and enigmatical jargon. Among others, the famous Quirinus Kahlman may be reckoned the principal of his followers in Germany: who says, he had learned more being alone in his study, from Boehmen, than he could have learned from all the wise men of that age together; and, that we may not be in the dark as to what sort of knowledge this was, he acquaints us, that amidst an infinite number of visions it happened, that, being snatched out of his study, he saw thousands of thousands of lights rising round about him. Nor has he been without admirers, and those in no small number, in England: among the foremost of whom stands the famous Mr William Law, author of *Christian Perfection*, &c. who has favoured his countrymen with an English edition of Jacob Boehmen's works in 2 vols 4to.

BOEOTIA, the name of two ancient kingdoms, one of which was founded or rather restored by Cadmus, and named by him *Boetia*, from the ox which is said to have directed him to the place where he built the capital of his new kingdom, better known afterwards by the name of *Thebes*. But as the inhabitants were scarce ever distinguished as a nation by the name of *Boetians*, but of *Thebans*, we refer to the article *THEBES* for their history, &c.

The other Boeotia was in Thessaly, and is said to have been founded by Boeotus the son of Neptune and brother of Æolus, by Arne the daughter of Æolus king of Æolis. This last, having sent his daughter to Metapontium a city of Italy, she was there delivered of those two sons, the eldest of whom she called after her father's name *Æolus*; and he possessed himself of the islands in the Tyrrhenian, now the Tuscan sea, and built the city of Lipara. Boeotus the younger son went to his grandfather and succeeded him in his kingdom, called it after his own name, and the capital city *Arne*, from his mother. All that we know of these Boeotians is, that they held this settlement upwards of 200 years; and that the Thessalians expelled them from it; upon which they came and took possession of that country, which till then had been called *Cadmeis*, and gave it the name of *Boetia*. Diodorus and Homer tells us, that these Boeotians signalized themselves at the Trojan war; and the latter adds, that five of Boeotus's grandsons, viz. Peneus, Leitus, Prothœnor, Arcefilaus, and Clonius, were the chiefs who led the Boeotian troops thither.

BOERHAAVE (Herman), one of the greatest physicians, as well as the best men, that this or per-

haps any age has ever produced, was born in 1668 at Boerhaave. Vorhout, a village near Leyden. At the age of 16 he found himself without parents, protection, advice, or fortune. He had already studied theology and the other ecclesiastical sciences, with the design of devoting himself to a clerical life; but the science of nature, which equally engaged his attention, soon engrossed his whole time. This illustrious person, whose name afterwards spread throughout the world, and who left at his death above L. 200,000, could at that time barely live by his labours, and was compelled to teach the mathematics to obtain necessaries. But in 1693, being received doctor in the science of physic, he began practice; and his merit being at length discovered, many powerful friends patronized him, and procured him three valuable employments: the first was that of professor of medicine in the university of Leyden; the second, that of professor of chemistry; and, thirdly, that of professor of botany. The Academy of Sciences at Paris, and the Royal Society at London, invited him to become one of their members. He communicated to each his discoveries in chemistry. The city of Leyden became in his time the school of Europe for this science, as well as medicine and botany. All the princes of Europe sent him disciples, who found in this skilful professor, not only an indefatigable teacher, but even a tender father, who encouraged them to pursue their labours, consoled them in their afflictions, and solaced them in their wants. When Peter the Great went to Holland in 1715, to instruct himself in maritime affairs, he also attended Boerhaave to receive his lessons. His reputation was spread as far as China: a Mandarin wrote to him with this inscription, "To the illustrious Boerhaave, physician in Europe;" and the letter came regularly to him. The city of Leyden has raised a monument in the church of St Peter, to the salutary genius of Boerhaave, *Salutifera Boerhaavii genio sacrum*. It consists of an urn upon a pedestal of black marble: six heads, four of which represent the four ages of life, and two the sciences in which Boerhaave excelled, form a group issuing between the urn and its supporters. The capital of this basis is decorated with a drapery of white marble, in which the artist has shown the different emblems of disorders and their remedies. Above, upon the surface of the pedestal, is the medallion of Boerhaave: at the extremity of the frame, a ribband displays the favourite motto of this learned man; *Simplex vigilum veri*, Truth unarrayed."

From the time of the learned Hippocrates, no physician has more justly merited the esteem of his contemporaries, and the thanks of posterity, than Boerhaave. He united to an uncommon genius, and extraordinary talents, the qualities of the heart, which gave them so great a value to society. He made a decent, simple, and venerable appearance, particularly when age had changed the colour of his hair. He was an eloquent orator, and declaimed with dignity and grace. He taught very methodically, and with great precision; he never tired his auditors, but they always regretted that his discourses were finished. He would sometimes give them a lively turn with raillery; but his raillery was refined and ingenious, and it enlivened the subject he treated of, without carrying with it any thing severe or satirical. A declared foe to all excess, he considered

Boerhaave. dered decent mirth as the salt of life. It was the daily practice of this eminent person, through his whole life, as soon as he rose in the morning, which was generally very early, to retire for an hour to private prayer, and meditation on some part of the Scriptures. He often told his friends, when they asked him how it was possible for him to go through so much fatigue? that it was *this* which gave him spirit and vigour in the business of the day. *This* he therefore recommended as *the best rule* he could give: for nothing, he said, could tend more to the health of the body than the tranquillity of the mind; and that he knew nothing which could support himself, or his fellow-creatures, amidst the various distresses of life, but a well-grounded confidence in the supreme Being upon the principles of Christianity. This was strongly exemplified in his own illness in 1722, which can hardly be told without horror; and by which the course of his lectures as well as his practice was long interrupted. He was for five months confined to his bed by the gout, where he lay upon his back without daring to attempt the least motion; because any effort renewed his torments, which were so exquisite, that he was at length not only deprived of motion but of sense. Here his medical art was at a stand; nothing could be attempted, because nothing could be proposed with the least prospect of success. But, having (in the sixth month of his illness) obtained some remission, he determined to try whether the juice of fumitory, endive, or succory, taken thrice a-day in a large quantity, (*viz.* above half a pint each dose), might not contribute to his relief; and by a perseverance in this method he was wonderfully recovered. This patience of Boerhaave's was founded not on vain reasonings, like that of which the Stoics boasted; but on a religious composure of mind, and Christian resignation to the will of God.

Of his sagacity and the wonderful penetration with which he often discovered and described, at the first sight of a patient, such distempers as betray themselves by no symptoms to common eyes, such surprising accounts have been given, as scarcely can be credited, though attested beyond all doubt. Yet this great master of medical knowledge was so far from a presumptuous confidence in his abilities, or from being puffed up by his riches, that he was condescending to all, and remarkably diligent in his profession: and he often used to say that the life of a patient (if trifled with or neglected) would one day be required at the hand of the physician. He always called the poor his *best patients*; for God (said he) is their paymaster. The activity of his mind sparkled visibly in his eyes. He was always cheerful, and desirous of promoting every valuable end of conversation; and the excellency of the Christian religion was frequently the subject of it: for he asserted, on all proper occasions, the divine authority and sacred efficacy of the Scriptures; and maintained, that they only could give peace of mind, that sweet and sacred peace which passeth all understanding; since none can conceive it but he who has it; and none can have it but by divine communication. He never regarded calumny nor detraction (for Boerhaave himself had enemies), nor ever thought it necessary to confute them. "They are sparks (said he) which, if you do not blow, will go out of themselves. The

surest remedy against scandal, is to *live it down* by a perseverance in well-doing; and by praying to God that he would cure the distempered minds of those who traduce and injure us." Being once asked by a friend, who had often admired his patience under great provocations, whether he knew what it was to be angry, and by what means he had so entirely suppressed that impetuous and ungovernable passion? he answered, with the utmost frankness and sincerity, that he was naturally quick of resentment: but that he had, by daily prayer and meditation, at length attained to this mastery over himself.

About the middle of the year 1737, he felt the first approaches of that fatal illness which brought him to the grave, *viz.* a disorder in his breast, which was at times very painful, often threatened him with immediate suffocation, and terminated in an universal dropsy: but during this afflictive and lingering illness, his constancy and firmness did not forsake him; he neither intermitted the necessary cares of life, nor forgot the proper preparations of death. About three weeks before his dissolution, when the Rev. Mr Schultens, one of the most learned and exemplary divines of the age, attended him at his country-house, the doctor desired his prayers, and afterwards entered into a most remarkable judicious discourse with him on the spiritual and immaterial nature of the soul; and this he illustrated to Mr Schultens with wonderful perspicuity, by a description of the effects which the infirmities of his body had upon his faculties; which yet they did not so oppress or vanquish, but his soul was always master of itself, and always resigned to the pleasure of its maker—and then he added, "He who loves God ought to think nothing desirable but what is most pleasing to the supreme goodness." These were his sentiments, and such was his conduct in this state of weakness and pain. As death approached nearer, he was so far from terror or confusion, that he seemed less sensible of pain, and more cheerful under his torments, which continued till the 23d day of September, 1738, on which he died (much honoured and lamented) between four and five in the morning, in the 70th year of his age—often recommending to the bye-standers a careful observation of St John's precepts concerning the love of God, and the love of man, as frequently inculcated in his first epistle, particularly in the fifth chapter. His funeral oration was spoken in Latin before the university of Leyden, to a very numerous audience, by Mr Schultens, and afterwards published at their particular desire. He wrote. 1. *Institutiones Medicæ.* 2. *Aphorismi de cognoscendis & curandis Morbis.* 3. *Institutiones & Experimenta Chemicæ.* 4. *Libellus de Materia Medica, et remediorum formulis quæ serviunt aphorismis.* Swieten published, *Commentaries upon his Aphorisms*, in 5 vols 4to; and several other works, all greatly esteemed.

BOERHAAVIA; a genus of the monogynia order, belonging to the monandria class of plants. There is no calyx: the corolla is monopetalous, campanulated, and plaited; and the seed is one, naked, and below. There are six species, all natives of the Indies. Some of these plants rise five or six feet high, but most of them only 18 inches or two feet. They carry flowers of a yellow or red colour, but are by no means so remarkable as to merit any particular description.

Boeschot,
Boethius.

BOESCHOT, a town of the Austrian Netherlands, in the province of Brabant, seated on the river Nethe, in E. Long. 4. 45. N. Lat. 51. 5.

BOETHIUS, or BOETIUS (Flavius Anicius Manlius Torquatus Severinus), a prose as well as poetical writer of the 6th century, born of one of the noblest families of the city of Rome. The time of his birth is related to have been about that period in the Roman history when Augustulus, whose fears had induced him to a resignation of the empire, was banished, and Odoacer king of the Herulians began to reign in Italy, viz. in the year of Christ 476, or somewhat after. The father of Boetius dying while he was yet an infant, his relations undertook the care of his education and the direction of his studies. His excellent parts were soon discovered; and, as well to enrich his mind with the study of philosophy as to perfect himself in the Greek language, he was sent to Athens. Returning young to Rome, he was soon distinguished for his learning and virtue, and promoted to the principal dignities in the state, and at length to the consulate. Living in great affluence and splendor, he addicted himself to the study of theology, mathematics, ethics, and logic; and how great a master he became in each of these branches of learning, appears from those works of his now extant. The great offices which he bore in the state, and his consummate wisdom and inflexible integrity, procured him such a share in the public councils, as proved in the end his destruction: for as he employed his interest with the king for the protection and encouragement of deserving men, so he exerted his utmost efforts in the detection of fraud, the repressing of violence, and the defence of the state against invaders. At this time Theodoric the Goth had attempted to ravage Campania; and it was owing to the vigilance and resolution of Boetius that that country was preserved from destruction. At length, having murdered Odoacer, Theodoric became king of Italy, where he governed 33 years with prudence and moderation, during which time Boetius possessed a large share of his esteem and confidence. It happened about this time that Justin, the emperor of the east, upon his succeeding to Anastasius, made an edict condemning all the Arians, except the Goths, to perpetual banishment from the eastern empire: in this edict Hormisdas bishop of Rome, and also the senate, concurred. But Theodoric, who, as being a Goth, was an Arian, was extremely troubled at it; and conceived an aversion against the senate for the share they had borne in this proscription. Of this disposition in the king, three men of profligate lives and desperate fortunes, Gaudentius, Opilio, and Basilus, took advantage. Having entertained a secret desire of revenge against Boetius, for having been instrumental in the dismissal of the latter from a lucrative employment under the king, they accused him of several crimes; such as the stifling a charge, the end whereof was to involve the whole senate in the guilt of treason; and an attempt, by dethroning the king, to restore the liberty of Italy; and, lastly, they suggested, that, to acquire the honours he was in possession of, Boetius had had recourse to magical art. Boetius was at this time at a great distance from Rome; however, Theodoric transmitted the complaint to the senate, enforcing it with a suggestion that the safety, as well of the

people as the prince, was rendered very precarious by this supposed design to exterminate the Goths. The senate, perhaps fearing the resentment of the king, and having nothing to hope from the success of an enterprise which, supposing it ever to have been meditated, was now rendered abortive, without summoning him to his defence, condemned Boetius to death. The king, however, apprehending some bad consequence from the execution of a sentence so flagrantly unjust, mitigated it to banishment. The place of his exile was Ticinum, now the city of Pavia, in Italy: being in that place separated from his relations, who had not been permitted to follow him into his retirement, he endeavoured to derive from philosophy those comforts which that alone was capable of affording to one in his forlorn situation, sequestered from his friends, in the power of his enemies, and at the mercy of a capricious tyrant; and accordingly he there composed that valuable discourse, intitled, *De Consolatione Philosophiæ*. About two years after his banishment, Boetius was beheaded in prison by the command of Theodoric. His tomb is to be seen in the church of St Augustine, at Pavia, near the steps of the chancel.

The extensive learning and eloquence of this great man are conspicuous in his works, which seem to have been collected with great care; an edition of them was printed at Venice, in one volume folio, in 1499. In 1570, Glareanus, of Basil, collated that with several manuscripts, and published it, with a few various readings in the margin. His chief performance is that abovementioned, *De Consolatione Philosophiæ*; a work well known in the learned world, and to which the afflicted have often applied. In particular, our Saxon king Alfred, whose reign, though happy upon the whole, was attended with great vicissitudes of fortune, had recourse to it at a time when his distresses compelled him to seek retirement; and that he might the better impress upon his mind the noble sentiments inculcated in it, he made a complete translation of it into the Saxon language, which, within these few years, has been given to the world in its proper character. And Camden relates, that queen Elizabeth, during the time of her confinement by her sister Mary, to mitigate her grief, read and afterwards translated it into very elegant English. But it deserves also particular notice, that he is the most considerable of all the Latin writers on music; and that his treatise *De Musica* supplied for some centuries the want of those Greek manuscripts which were supposed to have been lost.

BOG properly signifies a quagmire, covered with grass, but not solid enough to support the weight of the body; in which sense it differs only from marshes or fens, as a part from the whole: some even restrain the term *bog* to quagmires pent up between two hills; whereas fens lie in champaign and low countries, where the descent is very small.—To drain boggy lands, a good method is, to make trenches of a sufficient depth to carry off the moisture; and if these are partly filled up with rough stones, and then covered with thorn-bushes and straw, to keep the earth from filling up the interstices, a stratum of good earth and turf may be laid over all; the cavities among the stones will give passage to the water, and the turf will grow at top as if nothing had been done.

Boethius,
Bog.

Bog,

Bog
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Bohemia.

Bog, or *Bog of Gight*, a small town of Scotland, seated near the mouth of the river Spey, in W. Long.

2. 23. N. Lat. 57. 48.

Bog-Spavin. See FARRIERY, § xxxiii. 3.

BOGARMITÆ. See BOGOMILI.

BOGHO, or BUEIL, a town in the county of Nice in Piedmont, situated on the frontiers of France, in E. Long. 6. 45. N. Lat. 44. 12.

BOGLIO, a district in the territories of the duke of Savoy, lying on the river Tinca on the frontiers of Provence; the capital is of the same name.

BOGLIO, a town of Piedmont, and county of Nice, being the capital of a territory of the same name. E. Long. 4. 50. N. Lat. 44. 12.

BOGOMILI, or BOGARMITÆ, in church history, a sect of heretics, which sprung up about the year 1179. They held, that the use of churches, of the sacrament of the Lord's supper, and all prayer, except the Lord's prayer, ought to be abolished; that the baptism of catholics is imperfect; that the Persons of the Trinity are unequal; and that they ostentimes made themselves visible to those of their sect. They said, that devils dwelt in the churches, and that Satan had resided in the temple of Solomon from the destruction of Jerusalem to their own time.

BOGOTO, the capital of new Granada in Terra Firma in South America, near which are gold mines. It is subject to Spain. W. Long. 73. 55. N. Lat. 4. 0.

BOGUDIANA (Pliny), a part of the Mauritania Tingitana in Africa. According to Cluverius, it is the *Tingitana*, anciently so called from King Bogud.

BOHEA, in commerce, one of the coarsest kinds of tea that come from China. See THEA.

BOHEMIA, a kingdom of Europe subject to the house of Austria, and surrounded on every side with woods and mountains as with a natural rampart. It is bounded on the east by Moravia and part of Silesia, on the north by Lusace and Upper Saxony, on the west by Franconia, and on the south by Bavaria. Although this kingdom is situated in the middle of Germany, and its king is an elector of the empire, it has nevertheless its particular assemblies, customs, and language, different from the Germans. It is one of the most elevated countries of Europe: for no river enters into it, though many have their source there; the chief of which are the Elbe, the Oder, the Vistula, and the Morava. The air is cold and unwholesome; for they have more epidemical diseases than in the neighbouring countries. There are mines of silver, copper, lead, and even some veins of gold. The capital city is Prague; the others are Cutenburg, Konigengretz, Pilsen, Czasslaw, Budweys, Egra, Glatz, Tabor, and a great number of others: for they reckon more than 100 cities, among which almost 40 have the title of *Royal*. The name *Bohemia*, in the German language, signifies the *home* or *abode*, of the *Boii*, a people of ancient Gaul, who under their leader Sergovesus settled in that country about 590 years before the Christian æra. These Boii were soon after expelled by the Marcomanni, a nation of the Suevi, who were afterwards subdued by the Sclavi, a people of Scythia, whose language is still spoken in Bohemia and Moravia. Notwithstanding this expulsion of the Boii, the present inhabitants are still called *Bohemians* by foreigners, but the natives call themselves *Zechs*. At first they were governed by

dukes; but the emperor Otho I. conquered the duke of Bohemia, and reduced the province under the empire. Afterwards Henry V. gave the title of *king* to Ladislaus duke of Bohemia; and since that time these kings have been electors and chief cup bearers of the empire, and the kingdom has been elective; which privileges have been confirmed by the golden bull. Formerly the kings of Bohemia received the kingdom as a fief of the empire, which ceremony was practised upon the frontiers: after which, the standards of the principalities of which it is composed were given to them, without being torn and given to the people, as is done with the ensigns of the other fiefs of the empire. Ferdinand I. of Austria, having married Anne, sister of Louis, last king of Bohemia, who died without issue, and being elected king, that kingdom has remained in his family ever since. But the crown is conferred with some appearance of election; which right the states of Bohemia still pretend to claim, notwithstanding that, by the treaty of Westphalia, Bohemia is declared hereditary in the house of Austria.

The king of Bohemia is the first secular elector, and gives his opinion after the elector of Cologne; though he does not assist at the assembly of electors, except at the election of an emperor. For these 200 years past they have not appeared at the collegiate assemblies, nor even at the imperial diets. However, in 1708, the emperor caused one of his deputies, in quality of king of Bohemia, to enter into the college of electors at the diet of Ratisbon, by the form of re-admission, together with the deputy of the elector of Brunswick. The states of Bohemia have never been comprehended in the government, or in the circles of the empire; they are not subject to any of its jurisdictions, nor to the Roman months, taxes, or public contributions; and they owe nothing to the empire but what the emperor Leopold voluntarily imposed upon himself, which amounts to 6000 livres a-year for the imperial chamber. The king pays homage to the emperor and the empire for his states as first secular elector; otherwise he has a right to exercise, through the whole extent of his dominions, all authority that the royalty can give, provided he do not violate the laws of the kingdom; according to which he cannot raise contributions or taxes but at the time when the states are assembled, the appointing of which is entirely in their own power. The government of Bohemia is different from that of all other states, the affairs of the kingdom being managed by six different courts. First, the council of the regency, or the great royal council, in which presides the great judge or burgrave of Bohemia, and who has under him 18 lieutenants of the king and other assessors. Secondly, the council or superior chamber of justice, at which the great master of the kingdom is president. Thirdly, the chamber of fiefs. Fourthly, the new tribunal to judge the appeals of the German vassals in their differences on the account of fiefs; which court has also its president, vice-president, and assessors. Fifthly, the royal chamber of finances, which has a president and vice-president. Sixthly, the chancery, which always follows the court. Besides, every circle of Bohemia is governed by two bailiffs, who administer justice in their prefecture. The states are composed of the clergy, lords, nobles, and burghers. As to Moravia, there is a grand bailiff who governs it in the name of the king

Bohemian
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Boiano.

king of Bohemia, as Margrave of Moravia. He is at the head of the royal council, which is composed of three assessors, and in which all is transacted in the name of the king. This province is divided into five circles, each of which has its bailiff. There are, besides, other officers of justice, who have a right of judging only at certain times, and in particular cases, where an appeal is allowed.

Bohemia was divided by the emperor Charles IV. into 12 provinces, in each of which he ordered two captains to be appointed every year for the administration of the government. The same emperor caused the church of Prague to be erected into an archbishopric, with this advantage, that the archbishop of Prague should have the prerogative that the archbishop of Mentz formerly enjoyed, viz. of crowning the king of Bohemia. The duchy of Silesia, the marquise of Moravia, and that of Lusatia, formerly held of this crown, but now only that of Moravia, which is incorporated with the kingdom of Bohemia, and is in the possession of the house of Austria.

The only remarkable occurrence in the Bohemian history is the rebellion of the disciples of John Huss, and Jerome Prague, on account of their leaders having been burnt as heretics. This occasioned a bloody war of 16 years continuance. For a particular account of which, see the article HUSSITES.

BOHEMIAN BOLE. See BOLE.

Bohemian Brethren, a sect of Christian reformers which sprung up in Bohemia in the year 1467. They treated the pope and cardinals as antichrist, and the church of Rome as the whore spoken of in the Revelation. They rejected the sacraments of the Romish church, and chose laymen for their ministers. They held the Scriptures to be the only rule of faith, and rejected the popish ceremonies in the celebration of the mass, nor did they make use of any other prayer than the Lord's Prayer. They consecrated leavened bread. They allowed no adoration but of Jesus Christ, in the communion. They rebaptized all such as joined themselves to their congregation. They abhorred the worship of saints and images, prayers for the dead, celibacy, vows, and fasts; and kept none of the festivals but Christmas, Easter, and Whitsuntide.

In 1504, they were accused by the Catholics to King Ladislaus II. who published an edict against them, forbidding them to hold any meetings either privately or publicly. When Luther declared himself against the church of Rome, the Bohemian brethren endeavoured to join his party. At first that reformer showed a great aversion to them; but the Bohemians sending their deputies to him in 1523 with a full account of their doctrines, he acknowledged that they were a society of Christians whose doctrine came nearest to the purity of the gospel. This sect published another confession of faith in 1535, in which they renounced anabaptism, which they at first practised: upon which a union was concluded with the Lutherans, and afterwards with the Zuinglians, whose opinions from thenceforth they continued to follow.

BOHOL, one of the Philippine islands in Asia, lying to the northward of Mindanao, in E. Long. 122. 5. N. Lat. 10. 0.

BOIANO, a town of Italy, in the kingdom of Naples, and county of Molese, with a bishop's see. It

is seated at the foot of the Apennines, near the river Tiferno, in E. Long. 14. 38. N. Lat. 41. 30.

BOIARDO (MATTEO MARIA of Ferrara), count of Scandiano, celebrated for his Italian poems, lived in the 15th century. His principal work is his *Orlando innamorato*. His Latin eclogues and sonnets are also much admired.

BOJARS, denote Russian noblemen. See Russia.

BOIEMUM, (anc. geog.) a part of Germany, surrounded with the Montes Sudeti, Ptolemy; now called Bohemia. It took its name from the Boii, a people of Gaul, who removed thither before Cæsar's expedition into that country, (Cæsar); though he seems to err in the name. The Boii were afterwards driven out by the Marcomanni, and settled in the west of Vindelicia, which was afterwards called Bayern, and hence the name Bavaria.

BOII, (Cæsar); a people of Celtica, extending from the Ligeris to the Elaver, whence came the Boii of Gallia Cisalpina, whose migration is related by Livy.

BOII. See BOHEMIA.

BOIGUACU, in zoology, a synonyme of the boa constrictor. See BOA.

BOIL, or FURUNCLE. See the *Index* subjoined to MEDICINE, and SURGERY.

BOILEAU SIEUR DESPEREAUX (Nicholas), the celebrated French poet, was born at Paris in 1636. After he had gone through his course of polite literature and philosophy, his relations engaged him to the study of the law, and he was admitted advocate. But though he had all the talents necessary for the bar, yet he could not adapt himself to a science which turns upon continual equivocations, and often obliges those who follow it to clothe falsehood in the garb of truth. He therefore determined to study theology; but he could not long endure the thorns of school divinity. He imagined, that, to allure him more cunningly, chicanery, which he thought to avoid, had only changed her habit; and so he renounced the Sorbonne, betook himself entirely to the belles lettres, and took possession of one of the foremost places in Parnassus. The public gave his works the encomium they deserved; and Louis XIV. who always loved to encourage the sciences and polite literature, was not only pleased to have M. Boileau's works read to him constantly as he composed them, but settled a yearly pension of 2000 livres upon him, and gave him the privilege of printing all his works. He was afterwards chosen a member of the French academy and also of the academy of medals and inscriptions. This great man, who was as remarkable for his integrity, his innocence, and diffusive benevolence, as for the keenness of his satires, died of a dropsy on the 2d of March 1711, in the 75th year of his age. The *Lutrin* of Boileau, still considered by some French critics of the present time as the best poem to which France has given birth, was first published in 1647. It is with great reason and justice that Voltaire confesses the *Lutrin* inferior to the *Rape of the Lock*. Few poets can be so properly compared as Pope and Boileau; and, wherever their writings will admit of comparison, we may, without any national partiality, adjudge the superiority to the English bard. These two great authors resembled each other as much in the integrity of their lives, as in the subjects and execution of their several compositions. There are two ac-
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Boiardo
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Boileau.

Boiling.

tions recorded of Boileau, which sufficiently prove that the inexorable satirist had a most generous and friendly heart; when Patru, the celebrated advocate, who was ruined by his passion for literature, found himself under the painful necessity of selling his expensive library, and had almost agreed to part with it for a moderate sum, Boileau gave him a much superior price; and, after paying the money, added this condition to the purchase, that Patru should retain, during his life, the possession of the books. The succeeding instance of the poet's generosity is yet nobler:—when it was rumoured at court that the king intended to retrench the pension of Corneille, Boileau hastened to Madam de Montespan, and said, that his sovereign, equitable as he was, could not, without injustice, grant a pension to an author like himself, just ascending Parnassus, and take it from Corneille, who had so long been seated on the summit; that he entreated her, for the honour of the king, to prevail on his majesty rather to strike off his pension, than to withdraw that reward from a man whose title to it was incomparably greater; and that he should more easily console himself under the loss of that distinction, than under the affliction of seeing it taken away from such a poet as Corneille. This magnanimous application had the success which it deserved, and it appears the more noble, when we recollect that the rival of Corneille was the intimate friend of Boileau. The long unreserved intercourse which subsisted between our poet and Racine was highly beneficial and honourable to both. The dying farewell of the latter is the most expressive eulogy on the private character of Boileau: “Je regarde comme un bonheur pour moi de mourir avant vous,” said the tender Racine, in taking a final leave of his faithful and generous friend.

BOILING, or EBULITION, the bubbling up of any fluid. The term is most commonly applied to that bubbling which happens by the application of fire, though that which ensues on the mixture of an acid and alkali is sometimes also distinguished by the same name. Boiling, in general, is occasioned by the discharge of an elastic fluid through that which is said to boil; and the appearance is the same, whether it is common air, fixed air, or steam, that make its way through the fluid. The boiling of water is proved by Dr Hamilton of Dublin, in his essay on the ascent of vapour, to be occasioned by the lowermost particles of the water being heated and rarified into vapour by reason of the vicinity of the bottom of the containing vessel; in consequence of which, being greatly inferior in specific gravity to the surrounding fluid, they ascend with great velocity, and lacerating and pushing up the body of water in their ascent, give it the tumultuous motion called *boiling*. That this is occasioned by steam, and not by particles of air or fire, as some have imagined, may be very easily proved in the following manner: Let a common drinking glass be filled with hot water, and then inverted into a vessel of the same: as soon as the water in the vessel begins to boil, large bubbles will be observed to ascend in the glass, which will displace the water in it, and in a short time there will be a continual bubbling from under its edge; but if the glass is then drawn up, so that its mouth may only touch the water, and a cloth dipt in cold water be applied to the outside, the steam within it will be instantly condensed,

and the water will ascend so as to fill it entirely, or very nearly so. See the article EVAPORATION.

BOILING, in trade and manufactures, is a preparation given to divers sorts of bodies by making them pass over the fire, chiefly in water, though sometimes in other liquors. In this sense we speak of the boiling of salt, boiling of sugar, copperas, &c.

Boiling of Silk with Soap is the first preparation in order to dyeing it. Thread is also boiled in a strong lixivium of ashes to prepare it for dyeing.

BOILING, in the culinary art, is a method of dressing meats by coction in hot water, intended to soften them, and dispose them for easier digestion. The effects of boiling are different according to the kinds and qualities of the water. Pulse boiled in sea-water grow harder; mutton boiled in the same becomes softer and tenderer than in fresh water, but tastes saltish and bitter.

Boiling to Death (*caldariis decoquere*), in the middle age; a kind of punishment inflicted on thieves, false coiners, and some other criminals.

BOILING is also a method of trying or essaying the goodness or falseness of a colour or dye. The stuff is to be boiled in water with certain drugs, different according to the kind or quality of the colour, to try whether or no it will discharge, and give a tincture to the water. With this view crimson silks are boiled with alum, and scarlots with soap, in quantity equal to the weight of the silk.

Boiling-Wells, in natural history. See *BURNING-Springs*, and *ICELAND*.

BOINITZ, a town of Upper Hungary, in the county of Zell, remarkable for its baths and the quantity of saffron that grows about it. E. Long. 19. 10. N. Lat. 48. 42.

BOIOBI, in zoology, the name of a species of serpent found in America, and called by the Portuguese *cobra de verb*. It is about an ell in length, of the thickness of a man's thumb, and is all over of a very beautiful and shining green. Its mouth is very large, and its tongue black. It loves to be about houses, and never injures any creature unless provoked or hurt; but it will then bite, and its poison is very fatal. The natives take as a remedy against its poison, the root *caa apia* bruised, and mixed with water. See *CAA Apia*.

BOIORUM DESERTA, (anc. geog.) a district of Pannonia, so called from the extinction of the Bœii by the Getae. Now the Weinerwald, of Lower Austria, towards Stiria, to the east of mount Cetius, or the Hahlenberg, and south of Vindobona or Vienna.

BOQUIRA, the American name for the rattlesnake.

BOIS-LE-DUC, called by the Dutch *Hertogen-bosch*, a large, strong, and handsome town of the Netherlands, in Dutch Brabant, seated between the rivers Dommel and Aa among morasses, in E. Long. 6. 16. N. Lat. 51. 45.

Bois de Soignies, the forest of Soignies in the Austrian Netherlands and province of Brabant, about three miles south east of Brussels.

Bois de Coiffi, the name given to a South American tree growing about Surinam, held in the highest estimation by the Indians in that part of the world, and now recommended to the physicians in Europe by Dr Ferriar.

Boiling
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Bois.

Boissard
Bokhara.

Fermin in a treatise lately published at Amsterdam. The root is esteemed an excellent stomachic, restoring the appetite, and assisting digestion; but it is chiefly celebrated as an infallible remedy against even the most inveterate intermittents. It is said also to be used with great safety and advantage in every species of remittent and continued fever, with patients of all ages, sexes, and conditions, even during pregnancy, and in the puerperal state. Before employing it, however, it is absolutely necessary to administer either a purgative or emetic. The best method of exhibiting it is in decoction: half an ounce of the bark of the root must be boiled in a close vessel with six pints of water till one half be consumed; the decoction is then strained off, and a cupful taken every two hours till the fever is entirely extinguished. Six or seven days after a cure is thus performed, it is generally necessary to repeat the purgative.

BOISSARD (John James), a famous antiquarian, born at Besançon the capital of Franche Comte in France. He published several collections which are of great use to such as are desirous to understand the Roman antiquities. He had a great passion for this study; and drew with his own hand plans of all the ancient monuments of Italy. He died at Metz, October 30th 1602. His principal works are, 1. Four volumes in folio of Roman antiquities, adorned with plates engraved by Theodore de Bey and his two sons. 2. *Theatrum vite humane*; which contains the lives of 198 famous persons, with their portraits. 3. A treatise *de divinatione & magicis prestigiis*. These works are scarce, and esteemed by the antiquarians.

BOIT, an excellent painter in enamel. He was born in Stockholm, and bred a jeweller: which profession he intended to follow in England; but changed his design, and went into the country, where he taught children to draw. He there engaged a gentleman's daughter, who was one of his scholars, to promise him marriage; but the affair being discovered, he was thrown into prison. In that confinement, which lasted two years, he studied enamelling; an art to which he fixed, on his return to London, and practised with the greatest success. The prices he is said to have obtained for his work are almost incredible: but being engaged in a very large design for the court, and Queen Anne dying before it was completed, he ran in debt, his goods were seized by execution, and he fled to France; where he changed his religion, was countenanced by the regent, and obtained a pension of L. 250. *per annum*, but died suddenly at Paris in 1726. There is a large piece done by him at Kensington, representing Queen Anne sitting, and prince George standing by her; and at Bedford-house is another very large plate of the duke's father and mother.

BOITJAPO, in zoology, the name of a species of serpent found in America; and called by the Portuguese there, *cobra di apo*. It grows to seven or eight feet long, is about the thickness of a man's arm, and very small and taper towards the tail. Its back is of an olive colour; its belly yellow, and covered with very regular and elegant triangular scales. It feeds on frogs, &c. but is very poisonous, and its bite extremely fatal.

BOKHARA, a city of Tartary in Asia, and capital of Great Bukharia, situated one day's journey to the

north of the river Jehun, or Amu; in E. Long. 65. 50. N. Lat. 39. 15. In 1219 it was besieged by Jenghiz Khan, as being part of Sultan Mohammed's dominions, a descendant of the famous Mahmud Gazari. At that time, besides the city-walls, which were very strong, Bokhara had an outward inclosure 12 leagues in compass; which shut in not only the suburbs, but also many pleasant seats and farms watered by the river Soghd, from whence the ancient Sogdiana took its name. The Mogul army arrived before the place in July, and continued the siege during the following winter. In March 1220, they forced the outer wall, and began to besiege the city in form. Sultan Mohammed had left in the city a very numerous garrison under the command of three generals, who made a sally at the head of 20,000 men: but being repulsed with great loss, their courage failed them; and, instead of staying to defend the inhabitants, as soon as they had got into the city by one gate, passed out by another with their families, and almost all their soldiers, hoping to escape by the darkness of the night; but their design being discovered, they were pursued by a detachment of 30,000 Moguls; and being overtaken at the river Amu, they were, after a bloody dispute, almost all cut to pieces. Mean time, Jenghiz Khan, being informed of the confusion into which the city had been thrown by the desertion of the garrison, ordered an attack to be made on all sides at once; but while he was preparing for this, the magistrates and clergy went out and presented him with the keys of the city. Jenghiz Khan granted them their lives, on condition that they gave no shelter to any of the sultan's soldiers, and put out all who should be suspected of being in that prince's interest; which they promised to do upon oath. All the young people, however, who were displeased with the surrender, retired with the governor to the castle, which was very strong, and resolved to defend themselves to the last extremity. Jenghiz Khan, having taken possession of Bokhara, entered on horseback into the great mosque, and asked merrily if that was the sultan's palace? On being answered that it was the house of God, he alighted; and giving the principal magistrate his horse to hold, mounted the gallery where the ecclesiastics usually sat, and then taking up the Koran, threw it under the feet of his horses. Having staid there for some time, he retired to his camp; where, some days after, having assembled the principal people of Bokhara, and ascended a pulpit erected for that purpose in the midst of them, he began his speech by praising God, and recounted all the favours he had received from the Almighty: he then mentioned the perfidious behaviour of their sultan towards himself, telling them that God had sent him to rid the world of such wicked men. As to them, he testified his satisfaction for their having freely furnished his army with necessaries; and promised that his soldiers should not meddle with any goods which they made use of in their houses; but commanded them to deliver up what they had hidden, under pain of being tortured. This speech had such an effect, that the poor inhabitants delivered up every thing, as well what they had concealed as what they had present use for; notwithstanding which, the tyrant soon after caused the city to be burnt, on pretence that some of the sultan's soldiers were concealed in it. As all the houses were made

Bokhara.

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Boles.

made of wood, except the sultan's palace which was built of stone, and some few private houses of brick, the whole was utterly consumed; and Jenghiz Khan having found some few soldiers that had actually concealed themselves, put them all to death without mercy. The castle surrendered at discretion soon after; and though it was demolished, the governor and garrison, out of a very extraordinary piece of clemency from so bloody a tyrant, had their lives spared. Bokhara continued in ruins for some years, but at length Jenghiz Khan ordered it to be rebuilt. It is now large and populous; and is the residence of a khan who is altogether despotic, though his power reaches but a little way without the city. The town is seated on a rising ground, with a slender wall of earth and a dry ditch. The houses are low, built mostly of mud; but the caravanseras and mosques, which are numerous, are all of brick. The bazars or market-places, which have been stately buildings, are now mostly in ruins. The inhabitants are more civilized and polite than some of their neighbours; and yet are cowardly, cruel, effeminate, and very perfidious. Great numbers of Jews and Arabians frequent this place, though they are much oppressed, and frequently deprived of all their properties by the khan or his attendants at pleasure. At best they pay heavy taxes, and it is almost criminal to be rich.

BOL (Hans or John), a painter, born at Mechlin in 1534. He received his first instructions from a master of no great repute, whom he soon left; and going to Heidelberg, employed himself in copying several pictures of the eminent artists. His subjects are chiefly landscapes with animals; but he also sometimes painted history, with no small success. We have by him a set of landscapes, views in Holland, slightly etched, but in a style that indicates the hand of the master. He died in 1593.

BOL (Ferdinand), a celebrated painter both of history and portraits, was born at Dort in 1611, and educated at Amsterdam. In the school of the celebrated Rembrandt Gerretz, he received his instructions as a painter; and imitated the style of his master with no little success, not only in his pictures but in his engravings. Bol's etchings are bold and free. The lights and shadows in them are broad and powerful, which renders the effect very striking; but they want that lightness of touch and admirable taste which those of Rembrandt possess in so great a degree. Bol died at Dort, the place of his birth, in 1681, aged 70.

BOKHARIA. See **BUKHARIA**.

BOLANDUS (John), a famous Jesuit, born at Tillemont in the Netherlands, in 1596. He distinguished himself by writing the lives of the saints, under the title of *Acta Sanctorum*, of which he published five volumes in folio; but died while he was labouring at the sixth, in the 70th year of his age. The continuators of that work are called *Bollandists*.

BOLBITINUM, (anc. geog.), the second mouth of the Nile reckoning from west to east; now very small, choaked up with sand, and called *le Bras de Belin*.

BOLENTIUM, (anc. geog.), a town of Pannonia Superior; now *Rackersburg* in Stiria. See **RACKERSBURG**.

BOLES, are viscid earths, less coherent and more friable than clay; more readily uniting with water,
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and more freely subsiding from it. They are soft and unctuous to the touch; adhere to the tongue; and by degrees melt in the mouth, impressing a light sense of astringency. There are a great variety of these earths; the principal of which are the following.

1. Armenian bole, when pure, is of a bright red colour with a tinge of yellow: It is one of the hardest and most compact bodies of this class, and not smooth and glossy like the others, but generally of a rough and dusty surface. It does not effervesce with acids, though some part of it is dissolved by all of them. Neumann observes, that four ounces of Armenian bole distilled in a glass retort in an open fire, yielded three drachms of a saline phlegm, which smelt a little urinous, and changed syrup of violets green. In the neck of the retort was found a little powdery saline matter which had an ammoniacal taste, but it was in too small quantity to be collected or further examined. Like most other coloured earths, this kind of bole contains a portion of ferruginous matter, to which the colour is owing; and which may be separated by the magnet, after the bole has been calcined with oil or other inflammable matters. It is likewise impregnated with vitriolic acid; and hence, when mixed with nitre or sea-salt, it extricates the acids of these salts in the fire.

2. French bole is of a pale red colour, variegated with irregular specks of white and yellow. It is much softer than the Armenian, and slightly effervesces with acids.

3. Bole of Blois is yellow, remarkably lighter than most of the other yellow earths, and effervesces strongly with acids.

4. Bohemian bole is of a yellow colour, with a cast of red, and generally of a flaky texture. It is not acted on by acids.

5. Lemnian earth is of a pale red colour, and slightly effervesces with acids.

6. Silesian bole is of a pale yellow colour, and acids have no sensible effect upon it.

These and other earths, made into little masses, and stamped with certain impressions, are called *terra sigillata*. They have been recommended as astringent, sudorific, and alexipharmic; but these and many other virtues that have been ascribed to them appear to have no foundation. They are still, however, prescribed in fluxes and complaints of the *primæ viæ*.

BOLESIAFF, or **BUNTZLAU**, a town of Silesia, seated on the river Bobar, in E. Long. 16. 0. N. Lat. 51. 12.

BOLESIAUS I. and II. kings of Poland. See **POLAND**.

BOLETUS, **SPUNK**: A genus of the order of fungi, belonging to the cryptogamia class of plants; of which botanists enumerate 17 species. The following are the most remarkable. 1. The *suberosus*, or white cork spunk, grows commonly on the trunks of birch and willow trees in England and Scotland. It grows sessile and horizontal; its figure is semicircular; the upper side convex, the under nearly plain; of various sizes, from that of an ass's hoof to a peck-measure. The upper surface is quite white, generally covered with a short strong down, but sometimes smooth. The flesh or internal substance is thick, white, tough, light, and spongy, like cork; and is sometimes cut and shaped by the country people, and used as corks in their bottles:

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† *Phil.*
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vol. xlviii.
p. 2. and
xlix. p. 1.

but such corks must not be suffered to touch the liquid, for moisture soon renders them soft and useless. 2. The ignarius, or touch-wood spunk, is frequent on the trunks of old trees of all kinds, especially ash. It consists of a very hard woody substance, in shape like a horse's hoof, and grows of various sizes, from a man's fist to that of his head and larger. The upper side is smooth, but uneven, distinguished near the rim by elevated zones of different colours, brown, grey, tawny, &c. The flesh is of a tawny brown colour, extremely hard and tough. This fungus is made use of in Germany and some parts of England for tinder. The Germans boil it in strong lye, dry it and boil it again in solution of saltpetre. The Laplanders burn it about their habitations, in order to keep off a species of the gadfly which is fatal to the young reindeer. It has been used to stop the bleeding of the vessels after amputations†. For this purpose the hard outer part is cut off, and the soft inner substance is beat with a hammer to make it still softer. It is best when gathered in August or September. 3. The bovinus, or cow-spunk, is frequent in woods and pastures. It is generally of a brown colour, though sometimes it is tawny, yellowish brown, reddish brown, deep red, purple, or greenish brown. The flesh is yellow, white, or reddish. The young plants are eaten in Italy, and esteemed a great delicacy. The Germans also account them a dainty, calling them *gombas*, and *brat-bulz*. Cows, deer, sheep, and swine, will feed upon this and other boleti, and are sometimes greatly disordered by them. In cows and other cattle they have been known to create bloody urine, nauseous milk, swellings of the abdomen, inflammations of the bowels, stoppages, diarrhoeas, and death. In sheep they bring on a scirrhus liver, a cough, a general wasting, and dropsy. *Scarabs*, *dermestes*, and many other insects, feed upon and breed in them in abundance. 4. The pini larices, or agaric of the shops, grows on old larch trees. This fungus is an irregular spongy substance, extremely light, and of an uniform snowy whiteness, (except the cortical part, which is usually taken off before the agaric is brought into the shops). It cuts freely with a knife, without discovering any hardness or grittiness, and readily crumbles betwixt the fingers into a powder. It has no remarkable smell; its taste is at first sweetish; but on chewing for a short time, it proves acrid, bitter, and nauseous. Agaric was formerly in great esteem as a cathartic, but the present practice has almost entirely rejected its use. It is now rejected both by the London and Edinburgh Colleges, but it still retains a place in most of the new foreign Pharmacopœias. It operates exceedingly slowly, insomuch that some have denied it to have any purgative virtue at all. Given in substance, it almost always occasions a nausea, not unfrequently vomiting, and sometimes excessive tormina of the bowels: these effects are attributed to its light farinaceous matter adhering to the coats of the intestines, and producing a constant irritation. The best preparation of agaric seems to be an extract made with water, in which fixed alkaline salt has been dissolved; or with vinegar or wine: the first is said by Boulduc; and the two latter by Neumann, to prove an effectual and safe purgative. Nevertheless, this is at best a precarious medicine, of which we stand in no manner of need.

BOLEYN (Ann), queen of Henry VIII. of Eng-

land; memorable in the English history, as the first cause of the reformation, as the mother of queen Elizabeth under whom it was completely established, and also on account of her own sufferings. She was the daughter of Sir Thomas Boleyn, and born in 1507. She was carried into France at seven years of age by Henry VIII's sister, who was wife of Louis XII: nor did she return into England when that queen retired thither after the death of her husband; but staid in the service of queen Claudia the wife of Francis I. and after the death of that princess went to the duchess of Alençon. The year of her return is not well known: some will have it to have been in 1527, others in 1525. This much is certain, that she was maid of honour to queen Catharine of Spain, Henry VIII's first wife; and that the king fell extremely in love with her. She behaved herself with so much art and address, that by refusing to satisfy his passion, she brought him to think of marrying her: and the king, deceived by her into a persuasion that he should never enjoy her unless he made her his wife, was induced to set on foot the affair of his divorce with Catharine, which at last was executed with great solemnity and form. A celebrated author observes, that "That which would have been very praise-worthy on another occasion, was Anne Boleyn's chief crime: since her refusing to comply with an amorous king, unless he would divorce his wife, was a much more enormous crime than to have been his concubine. A concubine (says he) would not have dethroned a queen, nor taken her crown or her husband from her; whereas the crafty Anne Boleyn, by pretending to be chaste and scrupulous, aimed only at the usurpation of the throne, and the exclusion of Catharine of Arragon and her daughters from all the honours due to them." In the mean time, Henry could not procure a divorce from the Pope; which, we know, made him resolve at length to disown his authority, and to sling off his yoke. Nevertheless he married Anne Boleyn privately upon the 14th of November 1532, without waiting any longer for a release from Rome; and as soon as he perceived that his new wife was with child he made his marriage public. He caused Anne Boleyn to be declared queen of England on Easter-eve 1533, and to be crowned the first of June following. She was brought to bed upon the 7th of September of a daughter, who was afterwards queen Elizabeth; and continued to be much beloved by the king, till the charms of Jane Seymour had fired that prince's heart in 1536. Then his love for his wife was changed into violent hatred: he believed her to be unchaste, and caused her to be imprisoned and tried. "She was indicted of high treason, for that she had procured her brother and other four to lie with her, which they had done often: that she had said to them, that the king never had her heart; and had said to every one of them by themselves, that she loved him better than any person whatever; which was to the slander of the issue that was begotten between the king and her. And this was treason according to the statute made in the 26th year of this reign; so that the law which was made for her and the issue of her marriage, is now made use of to destroy her." She was condemned to be either burnt or beheaded; and she underwent the latter on the 19th of May 1536. The right reverend author of the *History of the Reformation*, relates

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relates some very remarkable things of her behaviour during the time of her imprisonment, and a little before her execution. When she was imprisoned, she is said to have acted very different parts; sometimes seeming devout and shedding abundance of tears, then all of a sudden breaking out into a loud laughter. A few hours before her death, she said, that the executioner was very handy: and besides, that she had a very small neck; at the same time feeling it with her hands, and laughing heartily. However, it is agreed that she died with great resolution; taking care to spread her gown about her feet, that she might fall with decency; as the poets have related of Polyxena, and the historians of Julius Cæsar. Roman-catholic writers have taken all occasions to rail at this unhappy woman, as well through vexation at the schism which she occasioned, as for the sake of defaming and dishonouring Queen Elizabeth by this means; and they have triumphed vehemently, that in the long reign of that queen, no endeavours were used to justify her mother. But either Queen Elizabeth or her ministers are greatly to be admired for prudence in this respect; since it is certain, that Anne Boleyn's justification could never have been carried on without discovering many things which must have been extremely prejudicial to the queen, and have weakened her right instead of establishing it. For though the representations of the papists are in no wise to be regarded, yet many things might have been said to the disadvantage of her mother, without transgressing the laws of true history; as that she was a woman gay even to immodesty, indiscreet in the liberties she took, and of an irregular and licentious behaviour.

BOLINGBROKE, or **BULLINGBROKE**, a town of Lincolnshire in England, and of great antiquity, but now in a mean condition. It gives title of Viscount to the St Johns of Battersea. E. Long. 0. 40. N. Lat. 53. 15.

BOLINGBROKE (Henry St John), lord viscount, a great statesman and philosopher, descended from an ancient and noble family, was born about the year 1672. He had a regular and liberal education; and by the time he left the university, was considered as a person of uncommon qualifications: but with great parts, he had, as it usually happens, great passions, and these hurried him into many indiscretions and follies. Contrary to the inclinations of his family, he cultivated Tory connections; and gained such an influence in the House of Commons, that in 1704 he was appointed secretary of war and of the marines. He was closely united in all political measures with Mr Harley: when, therefore, that gentleman was removed from the seals in 1707, Mr St John resigned his employment; and in 1710, when Mr Harley was made chancellor of the exchequer, the post of secretary of state was given to Mr St John. In 1712 he was created Baron St John of Lediard-Tregoze in Wiltshire, and Viscount Bolingbroke. But being overlooked in the bestowal of vacant ribbons of the order of the garter, he resented the affront, renounced the friendship of Harley then earl of Oxford, and made his court to the Whigs. Nevertheless, on the accession of George I. the seals were taken from him; and being informed that a resolution was taken to pursue him to the scaffold, for his conduct regarding the treaty of Utrecht, he withdrew to France. Here he accepted an invitation to enter into

the Pretender's service, and accepted the seals as his secretary: but he was as unfortunate in his new connections as in those he had renounced; for the year 1715 was scarcely expired, when at the same time that he was attainted of high treason at home, the seals and papers of his foreign secretary's office were taken from him; followed by an accusation from the Pretender and his party, of neglect, incapacity, and treachery. Such a complication of distressful events threw him into a state of reflection, that produced by way of relief a *consolatio philosophica*, which he wrote the same year under the title of *Reflections upon exile*; and the following year drew up a vindication of his conduct with respect to the Tories, in the form of *A Letter to Sir William Wyndham*. His first lady being dead, he about this time espoused a niece of the famous Madam Maintenon, and widow of the Marquis de Villette, with whom he had a very large fortune. In 1723 the king was prevailed on to grant him a free pardon, and he returned in consequence to England; but was by no means satisfied within, while he was yet no more than a mere titular lord, and remained excluded from the house of peers. This stigma operated to fix him in enmity to Sir Robert Walpole, to whose secret enmity he attributed his not receiving the full extent of the king's clemency: hence he distinguished himself by a multitude of political writings, till the year 1735; when being thoroughly convinced that the door was finally shut against him, he returned once more to France. In this foreign retreat he began his course of Letters on the study and use of History, for the use of Lord Combury, to whom they are addressed. Upon the death of his father, who lived to be extremely old, he settled at Battersea, the ancient seat of his family, where he passed the remainder of his life in philosophical dignity. Pope and Swift, one the greatest poet, the other the greatest wit, of the time, perfectly adored him; and it is well known that the former received from him the materials for his incomparable poem the "Essay on Man."—He died in 1751, and left the care and benefit of his MSS to Mr Mallet, who published them together with his former printed work, in 5 vols 4to; they are also printed in 8vo.

BOLISAW, a town of the kingdom of Bohemia in Germany, situated in E. Long. 14. 35. N. Lat. 50. 25.

BOLKOWITZ; a town of Silesia in the duchy of Glogaw. E. Long. 15. 20. N. Lat. 51. 27.

BOLLARDS, large posts set into the ground on each side of a dock. On docking or undocking ships, large blocks are lashed to them; and through these blocks are reeved the transporting hawsers to be brought to the capstons.

BOLLITO, a name by which the Italians call a sea-green colour in artificial crystal. To prepare this colour, you must have in the furnace a pot filled with 40 lb. of good crystal, first carefully skimmed, boiled, and purified, without any manganese: then you must have twelve ounces of the powder of small leaves of copper thrice calcined, and half an ounce of zaffre in powder: mix them together; and put them at four times into the pot, that they may the better mix with the glass; stirring them well each time of putting in the powder, lest the mixture should swell and run over.

BOLOGNA, an ancient, large, and very handsome town of Italy, in the territory of the church, and capital

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pital of the Bolognese; an archbishop's see, and an university. The public buildings are magnificent, as well with regard to the architecture as the ornaments, especially the paintings, which are done by the greatest masters. There are a vast number of palaces, in one of which the pope's nuncio resides; the private houses are also well built. Here are 169 churches, and the town is said to contain about 80,000 inhabitants. All the gates and windows are open during the summer; inasmuch that one may see into their apartments and gardens, where there are vast numbers of orange-trees that perfume the air. It is a place of great trade, which is in some measure owing to a canal that runs from this city to the river Po. The Reno, which runs near Bologna, turns 400 mills that are employed in the silk-works; besides, they deal in wax, soap, hams, sausages, and even lap-dogs, which are greatly esteemed. It is seated at the foot of the Appennine mountains, in E. Long. 11. 30. N. Lat. 44. 27.

BOLOGNE, by the English commonly called *Bullen*, a city of Picardy in France, and capital of the Bolonnois, seated near the sea. It is divided into two towns, the Upper and Lower; the first is strongly fortified, the other is inclosed by walls only. The port is at the mouth of the river Lianæ, but the water is so shallow that no ships of burden can enter it. It is defended on the side of the river by a mole, which shelters it from the winds, and at the same time prevents the river from filling it with filth. E. Long. 1. 40. N. Lat. 50. 42.

BOLOGNESE, a small province of Italy, in the territory of the church, bounded on the north by the Ferrarese, on the west by the duchy of Modena, on the south by Tuscany, and on the east by Romania. It is watered by a great number of small rivers, which render its soil the most fertile of any in Italy. Bologna is the capital, and from the great produce of the land about it is called *Bologna the fat*. It produces abundance of all sorts of grain and fruits; particularly muscadine grapes, which are in high esteem. Here are mines of alum and iron; and the inhabitants fabricate large quantities of linen, silk stockings, and cloth.

BOLOGNESE. See GRIMALDI.

BOLOGNIAN or BONONIAN STONE, a phosphoric substance first discovered near Bologna in Italy, whence it received its name. It has been supposed to contain some metallic matter, on account of its great specific gravity; but it is now found to be only a compound of ponderous earth and vitriolic acid. It differs, however, from the artificial baroselenite in the proportion of its ingredients, the latter containing 33 parts of vitriolic acid and 67 of earth; the former 84 of earth, 13 of the most concentrated vitriolic acid, and three of water. Mr Scheffer, in the Memoirs of the Academy at Stockholm, for the year 1753, has communicated some experiments on a stone of this kind from China, which prove, that it perfectly agrees with the descriptions given in several books of a stone called *petuntse* by the Chinese, and which is said to be used in their porcelain manufactures.

BOLSANE, a town of Germany, in the territory of Tyrol, and circle of Austria. It is very agreeably situated in the midst of a fine large valley, full of villages, and abounding in vineyards. The wines in this valley are the best in all Tyrol; but they must be drank

the year after that of their growth, otherwise they become unfit for use. E. Long. 11. 11. N. Lat. 46. 42.

BOLSENNÀ, a town of Italy, in the territories of the pope, seated on a lake of the same name. E. Long. 11. 3. N. Lat. 42. 37.

BOLSTER, among surgeons, a soft yielding substance, either laid under the head or a broken limb. In this sense, bolsters are contrived for crooked, bunched, and otherwise distorted backs, shoulders, &c.

By a constitution made under archbishop Burchier, the clergy are forbidden to wear bolsters about their shoulders, in their gowns, coats, or doublets. The occasion of the prohibition is variously construed. Some say that bolsters came in fashion in the reign of King Richard III. who being necessitated, by his natural deformity, to pad, the courtiers, and even the clergy, did the same, out of complaisance to their prince; so that every body who had the misfortune to be born straight, was obliged to wear a bolster on his shoulders to be in the fashion. Others, however, controvert this; alleging that the constitution above-mentioned was made 20 years before the usurpation of Richard.

BOLSTERS of a Saddle, those parts of a great saddle which are raised upon the bows, both before and behind, to hold the rider's thigh, and keep him in a right posture.

BOLSWAERT, a town of the united Provinces, in West Friesland, and in the county of Westergoe. E. Long. 5. 35. N. Lat. 53. 6.

BOLSWERT, or BOLSWERD, (Boetius Adam à), an engraver and printseller established at Antwerp, was the descendant of a family who resided at the city of Bolswert in Friesland, from whence he derived his name. He flourished about 1620; but by what master he was instructed in the art of engraving, does not appear. He worked with the graver only; the free open style of the Bloemarts he imitated with great success; and perhaps perfected himself in their school. When he worked from Rubens, he altered that style; and his plates are neater, fuller of colour, and more highly finished. The two following from this master may be here mentioned. 1. The Resurrection of Lazarus, a large upright plate. 2. The Last Supper, its companion. Basan, speaking of this print, says, that it proves by its beauty, and the knowledge with which it is engraved, that Boetius could sometimes equal his brother Scheltius.

BOLSWERT or *Bolswerd*, (Scheltius à), an admirable engraver, was the brother of Boetius Adam à Bolswert, mentioned in the preceding article. We have no other account of his family than what is there given; nor unfortunately any of himself of the least consequence. The time of his birth and of his death, and the name of the master he studied under, are equally unknown. Bolswert worked entirely with the graver, and never called in the assistance of the point. His general character as an artist is well drawn by Basan, in the following words: "We have a large number of prints, which are held in great esteem, by this artist, from various masters; but especially from Rubens, whose pictures he has copied with all possible knowledge, taste, and great effect. The freedom with which this excellent artist handled the graver, the picturesque roughness of etching, which he could imitate without any other assisting instrument, and the ability he pos-

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Bolswert. fessed of distinguishing the different masses of colours, have always been admired by the connoisseurs, and give him a place in the number of those celebrated engravers, whose prints ought to be considered as models by all historical engravers, who are desirous of rendering their works as useful as they are agreeable, and of acquiring a reputation as lasting as it is justly merited." He drew excellently, and without any manner of his own; for his prints are the exact transcripts of the pictures he engraved from. His best works, though not always equally neat or finished, are always beautiful, and manifest the hand of the master. Sometimes we find his engravings are in a bold, free, open style: as the Brazen Serpent, the Marriage of the Virgin, &c. from Rubens. At other times they are very neat, and sweetly finished: as, the crowning with Thorns, and the Crucifixion, &c. from Vandyck. Mr Strutt observes, that his boldest engravings are from Rubens, and his neatest from Vandyck and Jordans.—How greatly Bolswert varied his manner of engraving appears from some prints, which, like the greater part of those of his brother Boetius, bear great resemblance to the free engravings of the Bloemarts, and to those of Frederic Bloemart especially; and form a part of the plates for a large folio volume, entitled *Academie de L'espee*, by Girard Thibault of Antwerp, where it was published, A. D. 1628; and to these he signs his name, "Scheltius," and sometimes "Shelderic Bolswert," adding the word *Bruxelle*. His name is usually affixed to his plates in this manner, "S. A. Bolswert." It is very necessary to caution the collectors of this master's works (those especially who are not very conversant with them), that many of them have been copied in a very careful manner, so as easily to deceive the unskilful. Some of these copies, as the Marriage of the Virgin from Rubens, &c. are by Lauwers. But those which are most likely to mislead, are by Ragot, a French engraver, employed by Mariette the print-seller, who frequently meeting with the reverses or counterproofs from the prints of Bolswert, gave them to the engraver; and he imitated them with the utmost precision. By this means the impressions from the plate copied come upon the paper the same way with the original. It is true his name is usually affixed at the bottom; but it is often cut off, and then the copy is not easily distinguished from the original. Among other prints thus imitated by Ragot from Bolswert, is Christ crucified between the two Thieves, where the soldier is represented piercing his side, from Rubens.

Among the variety of estimable engravings by this great artist, the few following may be here mentioned. 1. The Brazen Serpent, a large plate, lengthwise, from Rubens. Those impressions are the most estimable which have only the word *Antuerpie* at the right-hand corner, without the name of Giles Hendrix, which was afterwards inserted above it, and part of the small circle over the arms is left white. 2. Abraham offering his son Isaac, a large plate nearly square, from Theodore Rombout. 3. The education of the Virgin by Saint Anne, a middling-sized upright plate, from Rubens. Those impressions without the name of

Hendrix are the most esteemed. 4. The marriage of the Virgin, a middling-sized upright plate, from the same painter. Those impressions are best in which the word *Antuerpie* is not added to the name of Hendrix. 5. The adoration of the wise men, a middling-sized upright plate, from the same. The good impressions of this plate have the name of Vanden Enden. 6. The feast of Herod, in which is represented the daughter of Herodias, presenting the head of John the Baptist to her mother, a large plate, lengthwise, from the same. 7. The miraculous draught of fishes; a large print, lengthwise, on three plates, from the same. 8. Christ crowned with thorns; a large upright plate from Vandyck: An admirable print; with the name of Vanden Enden. 9. A crucifixion, where a figure appears presenting the sponge to Christ, St John and the Virgin are standing at the foot of the cross, and Mary Magdalene is reclining towards it: A large upright plate, from Vandyck. Of this admirable engraving there appear to have been four different impressions; though Basan mentions only three, and says that in the first the left hand of St John is hid. The chief marks of those impressions are: In the 1st, St John's left hand appears on the shoulder of the Virgin (A). In the 2d impression, the hand is erased: This Basan calls the first impression; and it sells at a very high price. In the 3d impression, the hand is restored: In the 4th, it is again erased: And in both, the short strokes upon the ground near the great toe of the figure who holds the sponge are crossed with second strokes; which cross-hatchings are not in the two first impressions. There are several other crucifixions by the same master after different designs. 10. The god Pan playing upon his flute, from Jordaens. 11. Mercury and Argus, a large plate, lengthwise, from the same. 12. A drunken Silenus, supported by a satyr, and another figure; a middling-sized upright plate from Rubens. Of these three last, the impressions without the address of Bloteling are the best. 13. A chase of lions; a large plate, lengthwise, from the same. 14. A variety of landscapes.

BOLT, among builders, an iron-fastening fixed to doors and windows. They are generally distinguished into three kinds, viz. plate, round, and spring bolts.

BOLTS, in gunnery, are of several sorts; as, 1. Transum-bolts, that go between the cheeks of a gun carriage, to strengthen the transums. 2. Prise bolts; the large knobs of iron on the cheeks of a carriage, which keep the hand-spike from sliding, when it is poizing up the breech of a piece. 3. Traverse bolts; the two short bolts, that, being put one in each end of a mortar carriage, serve to traverse her. 4. Bracket-bolts; the bolts that go through the cheeks of a mortar, and by the help of quoins keep her fixed at the given elevation. And, 5. Bed-bolts; the four bolts that fasten the brackets of a mortar to the bed.

BOLTS, in a ship, are iron pins, of which there are several sorts, according to their different makes and uses. Such are drive-bolts, used to drive out others. Ray-bolts, with jags or barbs on each side, to keep them from flying out of their holes. Clench-bolts, which are clenched with rivetting hammers. Forelock-bolts,

(A) Prints of this impression are very rare, and at sales have been known to fetch from L. 25 to L. 30.

Bolt
||
Bolton.

bolts, which have at the end a forelock of iron driven in to keep them from starting back. Set-bolts, used for forcing the planks, and bringing them close together. Fend or fender-bolts, made with long and thick heads, and struck into the uttermost bends of the ship, to save her sides from bruises. And ring-bolts, used for bringing to of the planks, and those parts whereto are fastened the breeches and tackle of the guns.

BOLT of Canvas, in commerce, the quantity of 28 ells.

BOLT-Rope, in naval affairs, a rope passing round the sail, to which the edges of it are sewed, to prevent the sail from tearing: the bottom part of it is called the *foot-rope*; the sides, *leeches*; and if the sail be oblong or square, the upper part is called the *head-rope*.

BOLTED FLOUR, that which has passed through the bolters. See the following article.

BOLTER, or **BOULTER**, a kind of sieves for meal, having the bottoms made of woollen, hair, or even wire. The bakers use bolters which are worked by the hand; millers have a larger sort, wrought by the motion of the mill.

BOLTING, a term of art used in our inns of court, whereby is intended a private arguing of cases. The manner of it at Gray's inn is thus: An ancient and two barristers sit as judges; three students bring each a case, out of which the judges choose one to be argued; which done, the students first argue it, and after them the barristers. It is inferior to *mooting*; and may be derived from the Saxon word *bolt*, "a house," because done privately in the house for instruction. In Lincoln's inn, Mondays and Wednesdays are the bolting days in vacation time; and Tuesdays and Thursdays the moot days.

BOLTING, or *Boulting*, the act of separating the flour from the bran by means of a sieve or bolter. See **BOLTER**.

BOLTING-Cloth, or *Bolster-cloth*, sometimes also called *Boulting-cloth*, denotes a linen or hair-cloth for sifting meal or flour.

BOLTING-Mill, a versatile engine for sifting with more ease and expedition. The cloth round this is called the *bolter*.

BOLTING, or *Boulting*, among sportsmen, signifies rousing or dislodging a coney from its resting place. They say, to *bolt* a coney, *start* a hare, *rouse* a buck, &c.

BOLTON or **BOULTON** (Edmund), an ingenious English antiquarian, who lived in the beginning of the 17th century. His most considerable work is that intitled *Nero Cæsar*, or *Monarchie depraved*, dedicated to the duke of Buckingham, lord-admiral, printed at London 1624, folio, and adorned with several curious and valuable medals. It is divided into 55 chapters, in some of which are introduced curious remarks and observations. In the 24th and 25th chapters he gives an account of the revolt in Britain, against the Romans, under the conduct of Boadicea, which he introduces with a recapitulation of the affairs in Britain from the first entrance of the Romans into this island under Julius Cæsar, till the revolt in the reign of Nero. In chapter 36th he treats of the East-India trade in Nero's time, which was then carried on by the river Nile, and from thence by caravans over land to the Red-Sea, and thence to the Indian ocean; the ready coin carried

yearly from Rome upon this account amounting, according to Pliny's computation, to above L.300,000 Sterling; and the usual returns in December and January yielding in clear gain an hundred for one. Besides this he wrote, 1. An English translation of Lucius Florus's Roman History. 2. Hypercritica, or a rule of judgment for reading or writing our histories. 3. The elements of armorica, &c.; and some other works.

BOLTON, a town of Lancashire in England, seated on the river Croell, and pretty well built. It has a manufacture for fustians, and the market is considerable for cloth and provisions. W. Long. 2. 15. N. Lat. 53. 55.

BOLUS, in pharmacy, an extemporaneous form of a medicine, soft, coherent, a little thicker than honey, and the quantity of which is a little morsel or mouthful; for which reason it is by some called *buc-cella*.

BOMAL, a town of Luxemburg in the Austrian Netherlands, situated on the river Ourt, in E. Long. 5. 30. N. Lat. 50. 20.

BOMB, in military affairs, a large shell of cast iron, having a great vent to receive the fusee, which is made of wood. The shell being filled with gunpowder, the fusee is driven into the vent or aperture, within an inch of the head, and fastened with a cement made of quicklime, ashes, brick-dust, and steel-filings, worked together in a glutinous water; or of four parts of pitch, two of colophony, one of turpentine, and one of wax. This tube is filled with a combustible matter, made of two ounces of nitre, one of sulphur, and three of gunpowder-dust, well rammed. To preserve the fusee, they pitch it over, but uncase it when they put the bomb into the mortar, and cover it with gunpowder-dust; which having taken fire by the flash of the powder in the chamber of the mortar, burns all the time the bomb is in the air; and the composition in the fusee being spent, it fires the powder in the bomb, which bursts with great force, blowing up whatever is about it. The great height a bomb goes in the air, and the force with which it falls, makes it go deep into the earth.

Bombs may be used without mortar-pieces, as was done by the Venetians at Candia, when the Turks had possessed themselves of the ditch, rolling down bombs upon them along a plank set sloping towards their works, with ledges on the sides, to keep the bomb right forward. They are sometimes also buried under ground to blow up. See **CAISSON**.—Bombs came not into common use before the year 1634, and then only in the Dutch and Spanish armies. One Malthus an English engineer is said to have first carried them into France, where they were put in use at the siege of Collioufe. The French have lately invented a new sort of bombs of vast weight called *comminges*.—The art of throwing bombs makes a branch of gunnery, founded on the theory of projectiles, and the laws and qualities of gunpowder. See **GUNNERY**, **PROJECTILES**, **GUNPOWDER**, &c.

BOMB-Chest, is a kind of chest filled usually with bombs, sometimes only with gunpowder, placed under ground, to tear and blow it up in the air with those who stand on it. Bomb-chests were formerly much used to drive enemies from a post they had seized or

Bolton
||
Bomb.

Bomb
||
Bombax.

were about to take possession of: they were set on fire by means of a fauciflee fastened at one end, but they are now much disused.

BOMB-Vessels, which are small ships formed for throwing bombs into a fortress, are said to be the invention of M. Reyneau, and to have been first used at the bombardment of Algiers. Till then it had been judged impracticable to bombard a place from the sea. See KETCH.

BOMBARD, a piece of ordnance anciently in use, exceedingly short and thick, and with a very large mouth. There have been bombards which have thrown a ball of 300 pound weight. They made use of cranes to load them. The bombard is by some called *basilisk*, and by the Dutch *donderbafs*.

BOMBARDIER, a person employed about a mortar. His business is to drive the fusee, fix the shell, and load and fire the mortar.

BOMBARDIER, in zoology. See CARABUS.

BOMBARDMENT, the havoc committed in throwing bombs into a town or fortress.

BOMBARDO, a musical instrument of the wind kind, much the same as the bassoon, and used as a bass to the hautboy.

BOMBASINE, a name given to two sorts of stuffs, the one of silk, and the other crossed of cotton.

BOMBAST, in composition, is a serious endeavour, by strained description, to raise a low or familiar subject beyond its rank; which, instead of being sublime, never fails to be ridiculous. The mind in some animating passions is indeed apt to magnify its objects beyond natural bounds: but such hyperbolical description has its limits; and, when carried beyond these, it degenerates into burlesque, as in the following example.

Sejanus. ——— Great and high,
The world knows only two, that's Rome and I.
My roof receives me not; 'tis air I tread,
And at each step I feel my advanc'd head
Knock out a star in heaven.

SEJAN. of *Ben. Johnson*, act 5.

A writer who has no natural elevation of genius is extremely apt to deviate into bombast. He strains above his genius, and the violent effort he makes carries him generally beyond the bounds of propriety.

BOMBAX, or SILK-COTTON TREE: A genus of the polyandria order, belonging to the monodelphia class of plants; and in the natural method ranking under the 37th order, *Columnifera*. The calyx is quinquefid: the stamina are five or many: the capsule is ligneous, quinquelocular, and quinquevalved: the seeds are woolly, and the receptacle pentagonous.

Species. 1. The ceiba, with a prickly stalk. 2. The pentandrum, with a smooth stalk. 3. The heptaphyllum, with leaves cut into seven parts. The first and second sorts grow naturally in both the Indies, where they arrive at a great magnitude, being some of the largest trees in these parts; insomuch that Bosman says he has seen in Guinea, trees of this kind so widely diffused that 20,000 armed men might stand under the branches of one. They generally grow with very straight stems. Those of the first sort are armed with short strong spines; but the second hath very smooth stems, which in the young plants are of a bright green; but after a few years they are covered with a grey

or ash-coloured bark, which turns brown as they grow older. The branches toward the top are garnished with leaves composed of five, seven, or nine oblong smooth little leaves, which are spear-shaped, and join to one common centre at their base, where they adhere to the long footstalk. The flower-buds appear at the end of the branches; and soon after the flowers expand, which are composed of five oblong purple petals, with a great number of stamina in the centre: when these fall off, they are succeeded by oval fruit as large as a swan's egg, having a thick ligneous cover, which when ripe opens in five parts, and is full of a dark short cotton, inclosing many roundish seeds as large as small peas. The cotton of the third sort is of a fine purple colour, but the size of the tree is not particularly mentioned by botanical writers. Besides these species, Mr Miller mentions another which he saw in the gardens of the late duke of Richmond at Goodwood, and was raised from seeds which came from the East Indies. The stem was very straight and smooth, the leaves were produced round the top upon very long footstalks, each being composed of seven or nine narrow silky small lobes, joined at their base to the footstalk in the same manner as the first and second; but they were much longer and reflected backward, so that at first sight it appeared very different from either of them.

Culture. These plants, being natives of warm climates, must always be kept in a stove. They are raised from seeds procured in the capsules from the places where they grow naturally. These are to be sown in the spring, in pots of light earth, plunged in a substantial hot-bed, of dung or tan, where the plants will appear in three or four weeks. They must then be placed separately in small pots, plunging them in the bark-bed, giving them shade and water, and shifting them occasionally into larger pots with fresh earth. They must be watered plentifully in summer, but moderately in winter.

Uses. The dark short cotton of the first two species is used by the poorer inhabitants of those places where such trees grow to stuff pillows or chairs, but is generally deemed unwholesome to lie upon. The beautiful purple down of the third is spun, wrought into clothes, and wore, without being dyed any other colour, by the inhabitants of the Spanish West Indies, where the tree naturally grows. Large pirogues, or canoes fit to carry a sail, are made both at Senegal and in America, of the trunk of the silk-cotton tree, the wood of which is very light, and found unfit for any other purpose. In Columbus's first voyage, says Miller, it was reported that a canoe was seen at Cuba made of the hollowed trunk of one of these trees, which was 95 palms long, of a proportional width, and capable of containing 150 men.

BOMBAX, in zoology, a synonyme of a species of CONUS.—*Bombax* is also used sometimes for silk or cotton; but the true botanic name of cotton is *Gossypium*. It is likewise applied by Linnæus to signify such insects as have incumbent wings, and feelers resembling a comb.

BOMBAY, an island in the East Indies near the coast of Decan, situated in N. Lat. 19. 0. and E. Long. 73. 0. It has its present name from the Portuguese *Bom-bahia*, on account of the excellent bay formed

Bombax,
Bombay.

Bombay. formed by it together with the winding of other islands adjacent. The harbour is spacious enough to contain any number of ships, and has likewise excellent anchoring ground, affording also, by its land-locked situation, a shelter from any winds to which the mouth may be exposed.

¹ This island more healthy now than formerly, and why.

This island was formerly reckoned exceedingly unhealthy, inasmuch that it had the name of the burying ground of the English, though it is now so far improved in this respect as to be no worse than any other place in the East Indies under the same parallel of latitude. The reasons of this unhealthiness and the subsequent improvements are enumerated by Mr Grose. 1. The nature of the climate, and the precautions required by it, being less understood than they are at present. 2. Formerly there obtained a very pernicious practice of employing a small fry of fish as manure for the cocoa-trees which grow in plenty on the island; though this has been denied by others, and perhaps with justice, as the putrid effluvia of animal bodies seems to be very effectually absorbed by the earth *, when buried in it. All agree, however, that the habitations in the woods or cocoa-nut groves are unwholesome by reason of the moisture, and want of a free circulation of air. 3. Another cause has been assigned for the superior healthiness of this island, viz. the lessening of the waters by the banking off a breach of the sea, tho' this does not appear satisfactory to our author. There is still, says he, a great body of salt water on the inside of the breach, the communication of which with the ocean being less free than before the breach was built, must be proportionably more apt to stagnate, and to produce noxious vapours.

Whatever may be the cause, however, it is certain, that the island of Bombay no longer deserves its former character, provided a due degree of temperance be observed; without which health cannot be expected in any warm climate.

² Climate, &c.

The climate of Bombay seems to be drier than many other parts under the same parallel. The rains last only four months of the year, but with short intermissions. The setting in of the rains is commonly ushered in by a violent thunder-storm called there the *Elephanta* from its extraordinary violence. The air, however, is then agreeably cooled, and the excessive heat, then nearly at its height, much moderated. The rains begin about the end of May, and go off in the beginning of September; after which there never falls any except a short transient shower, and that but very rarely.

³ Fish in all the stagnant pools formed by the rains.

A very extraordinary circumstance is related by Mr Ives concerning the island of Bombay during the rainy season, viz. that, ten days after the rains set in, every pool and puddle swarms with a species of fish about six inches long and somewhat resembling a mullet. Such a phenomenon has occasioned various speculations. Some have imagined that the exhaling power of the sun is so strong in the dry seasons as to be able to raise the spawn of these fishes into the atmosphere, and there suspend and nourish it till the rains come on, when it drops down again in the state of living and perfectly formed fish. A less extravagant supposition is, that after the ponds become dry, the spawn may possibly fall into deep fissures below the apparent bottom, re-

maining there during the dry season, and being supplied with a sufficient quantity of moisture to prevent it from corruption.

The quantity of rain that falls at Bombay in one season has been accurately measured by Mr Thomas, Mr Ives's predecessor as hospital surgeon. His apparatus consisted of a lead cylinder about nine inches diameter, and as many deep, marked on the inside with inches and tenths. To prevent the water from splashing over, he cut a hole two inches from the bottom, and placed the cylinder in a glazed earthen vessel; after which a wax-cloth was securely tied round it, so as to cover the vessel, and prevent any water from getting in, excepting what passed through the cylinder. When more than two inches fell, the hole in the side was stopped with wax, and the water poured from the vessel into the cylinder to ascertain its quantity. It was kept in an open place free from houses, and measured at six in the morning, noon, and six in the evening. The following table shows the quantity of rain that fell from the 25th of May, when it first began, though the sky looked cloudy over land from the beginning of the month.

MAY 1756.				JULY.			
Days of the month.	Quantity of rain in In. Tenths.			Days of the month.	Quantity of rain in In. Tenths.		
25	—	0	3	7	—	0	4
31	—	0	7	8	—	0	9
JUNE.				9	—	1	3
3	—	0	1	10	—	3	1
4	—	0	1	11	—	3	7
5	—	0	6	12	—	0	7
6	—	0	8	13	—	5	5
7	—	0	9	14	—	4	9
8	—	1	0	15	—	2	2
9	—	0	3	16	—	0	1
11	—	3	0	18	—	0	5
12	—	0	3	19	—	1	1
13	—	0	5	20	—	0	5
14	—	4	5	21	—	0	7
15	—	1	3	22	—	0	2
16	—	2	5	23	—	0	2
17	—	5	6	25	—	0	1
18	—	0	8	26	—	0	3
19	—	0	2	27	—	0	3
20	—	0	4	28	—	0	8
21	—	0	3	29	—	0	6
22	—	1	2	AUGUST.			
23	—	0	3	3	—	0	4
24	—	0	7	5	—	1	4
25	—	0	7	6	—	7	0
26	—	0	8	7	—	0	8
27	—	4	0	8	—	0	6
28	—	6	7	9	—	1	3
29	—	5	3	10	—	0	4
30	—	1	8	11	—	0	1
JULY.				12	—	0	2
1	—	1	3	13	—	1	1
2	—	2	0	14	—	0	8
3	—	0	9	15	—	0	3
4	—	1	9	16	—	0	2
5	—	0	5	17	—	0	2
6	—	0	2	18	—	0	2
				AUGUST.			

⁴ Account of the quantity of rain that falls during the rainy season.

Bombay.

AUGUST.

SEPTEMBER.

<i>Days of the month.</i>	<i>Quantity of rain in In. Tenths.</i>	<i>Days of the month.</i>	<i>Quantity of rain in In. Tenths.</i>
19 ———	0 2	22 ———	0 6
20 ———	0 2	23 ———	0 3
21 ———	0 1	24 ———	0 3
22 ———	0 4	25 ———	0 2
25 ———	0 4	26 ———	0 2
26 ———	0 7	27—30 ———	1 0
27 ———	0 5	OCTOBER.	
28 ———	0 2	2—7 ———	2 1
30 ———	0 1	9 ———	2 0
31 ———	0 2	15 ———	0 3
SEPTEMBER.		16, 17 ———	0 1
1 ———	0 2	22	The air fine and
3 ———	0 3	clear, without a cloud, the	
8 ———	0 1	land and sea-breezes re-	
9 ———	0 4	gular.	
10 ———	0 5	<i>Whole quantity of rain in</i>	
11 ———	0 9	<i>In. Tenths.</i>	
12 ———	0 2	May —	1 0
13 ———	0 5	June —	44 7
16 ———	0 4	July —	29 9
17 ———	0 4	August —	19 0
18 ———	0 5	September —	11 2
19 ———	0 6	October —	4 5
20 ———	3 2		
21 ———	0 4	Total	110 3

In this journal our author makes no mention of the elephanta above mentioned from Mr Grose as the fore-runner of the rainy season, though he mentions a storm under that name on the 9th of October. It was an excessive hard gale, with violent thunder, lightning, and rain; of which last there fell two inches in no more than four hours. Neither is the quantity of thunder and lightning at all comparable to what people unacquainted with hot climates might be apt to expect. The only thunder-storms mentioned in the journal were on May 31st, June 3d, 5th, 12th, 14th; September 7th, October 9th, an elephanta; and some thunder on the 15th of the same month.

5
Vegetable
production
of Bombay.

The vegetable productions of Bombay are very insignificant. Mr Ives says, that its "soil is so barren as not to produce any one thing worth mentioning;" but afterwards informs us, that its "natural produce is the cocoa-nut tree, from which they extract a liquor called *toddy*. This is soft and mild when drunk immediately: but if it stands long, it gathers strength, and becomes very intoxicating; whence probably arose the term *toddy-headed*. For each tree a tax of 20 s. a-year is paid to the company, which is appropriated towards maintaining the garrison and ships of war."

Mr Grose gives an account somewhat different.—"The *oarts*, or cocoa-nut groves, make the most considerable part of the landed property, being planted wherever the situation and soil is favourable to them. When a number of these groves lie contiguous to each other, they form what is called the *woods*; through which there is a due space left for roads and path-ways, where one is pleasantly defended from the sun at all hours in the day. They are also thick set with houses belonging to the respective proprietors as well as with the huts of the poorer sort of people; but are very unwholesome for the reasons already given. As to the

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cocoa-nut tree itself, not all the minute descriptions I have met with in many authors seem to me to come up to the reality of its wonderful properties and use. The cultivation of it is extremely easy, by means of channels conveying water to the roots, and by the manure already mentioned laid round them. An owner of 200 cocoa-nut trees is supposed to have a competency to live on.

"As to the rice fields, they differ in value, according to the fineness and quantity of rice they produce. The growth of this grain has a particularity not unworthy of notice, viz. that as it loves a watery soil, so to whatever height the water rises, wherever it is planted, the growth of the rice keeps measure with it, even to that of 12 and 14 feet; the summit always appearing above the surface of the water. It is also remarked, that the eating of new rice affects the eyes. The fact is certain, though the physical reason of it is unknown.

"Here and there are interspersed some few *brab* trees, or rather wild palm trees (the word *brab* being derived from *brabo*, which in the Portuguese signifies wild.) They bear an insipid kind of fruit, about the bigness of a common pear; but the chief profit from them is the toddy, or liquor drawn from them by incisions at the top, of which the arrack is reckoned better than that produced by the cocoa-nut trees. They are generally near the sea side, as they delight most in a sandy soil. It is on this tree that the *toddy birds*, so called from their attachment to it, make their exquisitely curious nests, wrought out of the thinnest reeds and filaments of branches, with an inimitable mechanism. The birds themselves are about the size of a partridge, but are of no value either for plumage, song, or the table.

"This island is a strong instance of the benefits of a good government, and a numerous population, by not a spot of it remaining uncultivated: so that tho' it is far from producing sufficient for the consumption of its inhabitants, and notwithstanding its many disadvantages of situation and soil, it yields incomparably more than the adjacent island of Salsette."

Among the curiosities of Bombay Mr Ives mentions a large *terapin* or land tortoise kept at the governor's house, the age of which was upwards of 200 years. Frogs, which abound every where through the East Indies, are very large at Bombay. Our author saw one that measured 22 inches from the extremities of the fore and hind feet when extended; and he supposes that its weight would not have been less than four or five pounds. On the sea shore round the island are a great variety of beautiful shells, particularly the sort called *ventle-traps*, or *wendle-traps*, held in great esteem among the ladies some time ago. Several pounds Sterling are said to have been given by a *virtuoso* for one of these shells when the Commodore Leslie's collection of shells was sold by auction.

Mr Ives enumerates the following kinds of snakes found on this island and other parts of the British empire in the East Indies. 1. The *cobra de capella*; growing from four to eight or nine feet long. They kill by their bite in 15 minutes. 2. The *cobra manila* is a small bluish snake, of the size of a man's little finger, and about a foot long, frequently seen about old walls. A species of these found at Bombay kill much sooner

Y y

than

Bombay. then even the former. 3. The *palmira*, a very thin beautiful snake, of different colours: its head is like that of the common viper, but much thicker than the body. Our author saw one that was four feet long, and the body not much thicker than a swan's quill. 4. The green snake is of a very bright green colour, with a sharp head: towards the tail it is smaller than in the middle. The largest part of it is no bigger than a tobacco-pipe. 5. The sand snake is small and short, but not less deadly than the others. 6. The *cobra de aurelia* resembles an earth-worm, is about six inches long, and no bigger than a small crow-quill. It kills by getting into the ear, causing madness, &c. 7. The *manila bomba* is a very beautiful snake, of almost the same size throughout the whole length, except at the two ends, where it comes to a point. It is white on the belly, but finely variegated on the back. It lives in the sand, and is said to sting with its tail, which occasions contractions in the joints.

Bombay is the most considerable English settlement on the Malabar coast; and by reason of its situation, may be styled the grand storehouse of all the Arabian and Persian commerce. It is also the most convenient place in all the East Indies for careening or heaving down large ships; and for small ones they have a very good dock. They have also a very good rope-yard; and indeed, says Mr Ives, "this is the only place, in this distant part of the world, for shattered ships to refit at, having always a good quantity of naval stores, and its very name conveying an idea of a safe retreat in foul weather."

8
Different
forts, &c.

On this island are many little forts and batteries, which carry some guns; but the principal fort, which defends the place, has above an hundred. Mr Grose finds fault with the situation of this last fort, which he says, not only does not command the harbour sufficiently, but is itself overlooked by an eminence called Dungharee-point. The castle itself is a regular quadrangle, well built of strong hard stone. In one of the bastions facing Dungharee point is a large tank or cistern which contains a great quantity of water constantly replenished by the stationary rains. There is also a well within the fort, but the water is not very good, and liable to be dried up by the heats. The water of Bombay in general indeed is not good, which has been given as a reason why the Gentoo merchants were not fond of settling upon it; for as they drink no wine nor spirituous liquors, they are very nice judges of the taste and qualities of waters.

When the town of Bombay began to increase considerably, it was judged proper to add the security of a wall round it to the strength of the fort it had before. Even then, however, it was neglected to take in the dangerous posts of Dungharee, which now evidently commands both the town and fort. There has since that time been added, at a great expence, a ditch that encompasses the wall, and can be flooded at pleasure, by letting in the sea, which terminates the ditch on two sides, so that the town is now entirely surrounded with water, and is one of the strongest places in India.

Next to Bombay, the most considerable fort on the island is that of *Mahim*. It is situated at the opposite extremity of the island, and commands the pass of Bandura, a fort directly opposite to it on the coast of

Salfette. From this island Bombay is separated by an arm of the sea, capable of receiving only small craft. The other forts are capable of making but a slight defence.

About two miles out of town, towards the middle of the island, the sea had gained so far almost to divide it in two, and render the roads impassable. A great quantity of this water, however, was drained off at a very considerable expence, and a causeway raised which kept it from overflowing again. This causeway is above a quarter of a mile in length, and considerably broad; "but (says Mr Grose,) there is one gross fault remarked in it; that, being bending near the middle, the architect has opposed to the sea a re-entering angle instead of a salient one." Within the beach, however, there is still a considerable body of water, that has a free communication with the sea, as appears by its ebbing and flowing; so that it is probable the causeway itself, erected at the expence of at least L. 100,000, may in no long time be totally undermined and thrown down.

When the island of Bombay was ceded to the Eng-⁹ Division, lish by the Portuguese, it was divided, and still con- &c. tinues to be so, into three Roman Catholice parishes, Bombay, Mahim, and Salvacam. The churches of these are governed by priests of that religion, and of any nation excepting Portugal, who were expressly objected to at the time of cession. The bulk of the land-proprietors at that time were Mestizos and Canarins. The former are a mixed breed of the natives and Portuguese; the latter purely aborigines of the country converted to the popish religion. The other land-owners were Moors, Gentoos, and Parsees; but these last are of more modern date, having purchased estates on the island. The company has also a very considerable landed estate either by purchases, confiscations for crimes, and seizures for debt. The land is laid out in cocoa-nut groves, rice-fields, and onion grounds, which last are reckoned of an excellent quality.

There is only one English church at Bombay, a very neat commodious building seated on a spacious area called the Green; which continues from the church to the fort, and is pleasantly laid out in walks planted with trees, round which the houses of the English inhabitants are mostly situated. These are generally only ground-floored, with a court-yard before and behind, in which are the offices and out-houses. They are substantially built of stone and lime, and smooth plastered on the outside. They are often kept white-washed, which, however neat, is in some respects very disagreeable, by reason of the excessive glare it occasions in reflecting the light of the sun. Few of them have glass windows to any apartment; the sashes being generally paned with a kind of transparent oyster-shells, square cut; which have the singular property of transmitting sufficient light, at the same time that they exclude the violent glare of the sun, and have besides a cool look. The flooring is generally composed of a kind of loam or stucco called *chunam*, being a lime made of burnt shells, which if well tempered in a peculiar manner known to the natives, is extremely hard and lasting, and takes such a smooth polish, that one may see his own face in it. But where terraces are made of this substance, unless it be duly prepared, and

Bombay.

Bombay. and which is very expensive, it is apt to crack by the sun's heat. Some attempts have been made to paint the stucco walls in apartments; but these have proved abortive through the ignorance of the artists, who have not chosen colours capable of resisting the alkaline power of the lime*. Our author remarks, that in the gardens of Surat he saw this kind of stucco made use of instead of gravel for the walks. They were a little raised above the garden beds, so that they must be instantly dry after the most violent rain; though their whiteness and polish must not only produce a disagreeable reflection in sunshine, but be extremely slippery to walk on. The houses of the black merchants are for the most part extremely ill built and inconvenient; the window-lights small, and the apartments ill distributed. Some, however, make a better appearance if only one story high; but even the best of them have a certain meanness in the manner, and clumsiness in their execution, which renders the architecture contemptible in comparison of the European. There is one convenience, however, in all the houses of Bombay, viz. small ranges of pillars that support a pent-house or shed, forming what are called in the Portuguese language *verandas*, either all around the house, or on particular sides of it, which afford a pleasing shelter from the sun, and keep the inner apartments cool and refreshed by the draught of air under them. The pagodas, or temples of the Gentoos, are low mean buildings, having usually no light but what is admitted by the door; facing which is the principal idol. They imagine that a dark gloomy place inspires a kind of religious horror and reverence; and are very fond of having these pagodas among trees, and near the side of a tank or pond, for the sake of their frequent ablutions. These tanks are often very expensive; being generally square and surrounded with stone steps that are very convenient for the bathers.

10
Inhabitants,
manners,
&c.

The natives of Bombay, though composed of almost every Asiatic nation, are shorter of stature and stronger than the inhabitants of the Coromandel coast. Here a palanquin which requires six men to carry it at Madras, or Fort St David, is carried by four. Here are some Persees, who, like their forefathers the ancient Persians, are followers of Zoroaster, who is said to have reduced into order the religion of the Persian magi; the fundamental maxim of which was the worshipping of one God under the symbol of light. They adore the sun, particularly when rising, with the most profound reverence and veneration; and likewise pay a kind of adoration to common fire. Mr Ives had once the opportunity of observing the manner in which they perform this devotion. A large brass pan was placed in the middle of the house with fire in it: before this fire, or rather on each side of it, two men were kneeling at their devotions, pronouncing their prayers with great rapidity. He was afterwards informed, that one of them was a priest, at that time on a visit to another priest in a fit of sickness. He was likewise informed, that the Persees have such a veneration for the fire, that they never put it out, or even breathe upon it; and he observed, that while the two priests were at their prayers over the pan of coals, they had a little white bib over their mouths, as he supposed to prevent their breath from approaching their favourite element. The prayers, however, from the simi-

larity of the sounds, appeared to him only to be a repetition of the same set of words. The visiting priest used many gestures with his hands over the fire, and afterwards stroked down the face of the sick priest, which our author looked upon to be the final benediction, as the ceremony ended immediately.

As the Gentoos burn their dead, one would imagine that the Persees, who have such a veneration for fire, would be desirous of having their bodies consumed by that element; but instead of this, they expose their dead bodies to be devoured by birds of prey; because, say they, a living man is composed of all the elements; so that it is but reasonable, after he is dead, that every particular element should receive its own again. On the top of Malabar hill, about two miles from the town of Bombay, there are two round buildings for receiving the dead bodies of the Persees, which remain there till the bones are clean picked by the birds. This is certainly an abominable custom, and affords very shocking spectacles; however, a guard is always placed at a little distance to prevent people from prying too narrowly into these matters, or, as Mr Ives says, to ensure the vultures of their repast without any disturbance. Mr Grose tells us, that on his going to look into one of these repositories, a Persee advised him in a friendly manner to let it alone, as no person, who was not a party concerned, would long survive such curiosity. He tells us also, that the person appointed to look after the dead, carefully observes which eye is first picked out by the birds, and from thence judge of the situation of the soul of the deceased; a state of happiness being indicated by the right eye being first picked out. Mr Ives observes, that by reason of the heat of the sun, much less noxious vapour is emitted by these bodies than might be expected; the flesh being soon shrivelled up, and the bones turning quite black.

At the extreme point of Malabar-hill there is a rock, on the descent to the sea, flat on the top, in which there is a natural crevice, which communicates with a hollow terminating at an exterior opening to the sea. This place is used by the Gentoos as a purifier from their sins. This purification is effected by their going in at the opening, and coming through the crevice, though it seems too small for people of any corpulence to pass.

In Bombay, and indeed in many other places of the East Indies, oxen are generally used instead of horses, not only for drawing carriages but for riding; and, however ridiculous such a practice may seem to us, it appears that they are not in this respect inferior to ordinary horses, being capable of going at the rate of seven or eight miles an hour. They are commonly of a white colour, with large perpendicular horns, and black noses. The only inconvenience that attends them, is, that, by being naturally subject to a lax habit of body, they sometimes incommode the rider with filth thrown upon him by the continual motion of their tails. In other respects they are far preferable to Indian horses, and will trot and gallop as naturally as the horses of this country. Admiral Watson, while at Bombay, was allowed a chaise drawn by two of these oxen by the East India Company. At the end of every stage the driver always put the near bullock in the place of the other; he then put his hand into both

Bombay.

11
Oxen used
here instead
of horses.

Bomb
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Bona.

their mouths, to take out the froth; without which precaution they would be in danger of suffocation.

For the History, Government, &c. of Bombay, see the articles *INDOSTAN*, and *East India COMPANY*.

BOMB-KETCH, a small vessel built and strengthened with large beams for the use of mortars at sea.

BOMBUS, in music, an artificial motion with the hands, imitating in cadence and harmony the buzzing of bees. The word is originally Greek, and signifies the buz or noise of bees, gnats, and the like. In this sense, bombus made one of the species of applause used by the ancient auditories.

BOMBUS, in medicine, denotes a murmuring noise, as of wind breaking out of a narrow into a larger cavity, frequently heard in the thick intestines. The bombus heard in the ears, in acute diseases, is laid down by Hippocrates as a sign of death.

BOMBYLIUS, in zoology, a genus of insects belonging to the order of diptera. The rostrum is long, bristly, and bivalved; the bristles being fixed between the horizontal valves. There are five species, viz. 1. The major, with black wings. 2. The medius, with a yellowish body, white behind, and the wings spotted with yellow. 3. The minor, with unspotted wings. 4. The ater, has red wings, but a little blackish at the base; and green feet. The above four are natives of Europe. 5. The capensis, with the wings spotted with black, an ash-coloured body, and white behind. It is a native of the Cape of Good Hope.

BOMENE, a sea-port town of the united Provinces in Zealand, seated on the northern shore of the island of Schonen, opposite to the island of Goree, in E. Long. 4. 0. N. Lat. 51. 50.

BOMMEL, a town of Dutch Guelderland, situated on the northern shore of the river Waal, in E. Long. 5. 50. N. Lat. 52. 0.

BOMONICI, in Grecian antiquity, young men of Lacedæmon, who contended at the sacrifices of Diana which of them was able to endure most lashes; being scourged before the altar of this goddess.

BONA, by the Moors called *Balederna*, a sea-port town of the kingdom of Algiers in Africa, situated in E. Long. 7. 57. N. Lat. 36. 5. It was formerly rich, populous, capital of the province of the same name under the kingdom of Constantina, and is supposed by some to be the ancient Hippo, once the seat of the great St Austin, and a sea-port built by the Romans. The inhabitants, however, deny it to be the ancient Hippo, which had been so often taken, retaken, and destroyed by the wars; and pretend it to be since rebuilt at the distance of two or three miles from the ancient Hippo, out of its ruins, and called *Baleed-el-Ugned*, from a sort of trees of that name that grow in the neighbourhood. It is now a very mean place, poorly built, and thinly inhabited, with scarce any traces of its former grandeur, except the ruins of a cathedral, or as others guess, of a monastery built by St Austin about three miles distance from the city. Near these ruins is a famed spring called by his name, much resorted to by the French and Italian sailors, who come to drink of its waters, and pay their devotions to a maimed statue said also to belong to the saint, but so mutilated that no traces either of face or dress are remaining; and as each of them strives to break off some splinter, or to scrape off some part of it on account of

its supposed sanctity, it will probably be soon reduced to a state of non-existence. Bona was taken by the pirate Barbarossa, and joined to his new kingdom of Algiers; but as quickly lost, and recovered by its old masters the Tuniseens, who soon after lost it again. It is commanded by a little fort, in which is a garrison of about 300 Turks, under the command of an aga, who is also governor of the town. The road for the ships is good for nothing before the town, but a little farther west is very deep and safe. Dr Shaw tells us, that the continual discharging of ballast into the road, and the neglect of cleansing the port which came to the very walls, is the cause of both becoming so unsafe and incommodious; though this might be easily remedied so as to make the town one of the most flourishing in all Barbary.

BONA Dea, the good goddess, in Pagan mythology, one of the names of Cybele. Others say, she was a Roman lady, the wife of one Faunus, and was famous for her chastity, and that after her death she was deified. Her sacrifices were performed only by matrons; and in so secret a manner, that it was no less than death for any man to be present at the assembly (see *CYBELE*). Cicero reproaches Clodius with having entered into this temple disguised as a singing woman, and having by his presence polluted the mysteries of the good goddess. What kind of mysteries these were, we may learn from Juvenal, Sat. VI. 313. The poet then mentions the adventure of Clodius.

*Atque utinam ritas veteres, et publica saltem
His intacta malis agerentur sacra: sed omnes
Noverunt Mauri, atque Indi, quæ psalteria penem
Majorem, quam sint duo Cæsaris Anticatones,
Illuc testiculi sibi conscius, unde fugit mus,
Intulerit.*

I wish at least our sacred rites were free
From these pollutions of obscenity:
But 'tis well known what finger, how disguis'd,
A lewd audacious action enterpris'd:
Into the fane, with women mix'd, he went,
Arm'd with a huge two-handed instrument;
A grateful present to these holy choirs,
Where the mouse, conscious of his sex, retires.

DRYDEN.

BONA Fides, in law. When a person performs any action which he believes at the time to be just and lawful, he is said to have acted *bona fide*.

BONA Mobilia, the same with moveable effects or goods.

BONA Notabilia, are such goods as a person dying has in another diocese than that wherein he dies, amounting to the value of 5 l. at least; in which case the will of the deceased must be proved, or administration granted in the court of the archbishop of the province, unless by composition or custom, any dioceses are authorized to do it, when rated at a greater sum.

BONA Patria, an assize of countrymen or good neighbours, where 12 or more are chosen out of the country to pass upon an assize, being sworn judicially in the presence of the party.

BONA Peritura, perishable goods. By stat. 13. Ed. I. cap. 4. the cargo of a ship that has been cast away shall be kept for a year and a day, and restored to the rightful owner; but if the goods be such as will not endure

Bona.

Bonaire
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Bond.

so long, they are *bona peritura*, which the sheriff is allowed to sell, and to account in money for the value.

BONA Vacantia, goods; such as royal-fish, shipwrecks, treasure-trove, waifs, and estrays, in which no one can claim a property. These goods by the law of nature, and by the imperial law, belonged to the first occupant or finder; but in the modern constitutions of European governments, they are annexed to the supreme power by the positive laws of the state.

BONAIRE, an island of South America, near the north coast of Terra Firma. It belongs to the Dutch; and abounds in kabritoos and salt. W. Long. 66. 18. N. Lat. 20. 16.

BONAIIS, very high mountains of Italy, in the duchy of Savoy, not far from Lafforeburg: in some seasons they cannot be ascended without great danger.

BONARELLI (Gui Ubaldo), an Italian count. He was intrusted with several important negociations, and was esteemed an able politician and learned philosopher. He was the author of a fine Italian pastoral, intitled, *Filli di Sciro*. He died at Fano, in 1608, aged 45.

BONAVENTURA (the bay of), in America, on the coast next the South Sea, in the Popayan. It has a port and harbour for ships; but the air is very unwholesome. W. Long. 75. 18. N. Lat. 3. 20.

BONAVENTURE, a celebrated cardinal, called, from his works, the *seraphic doctor*. He was born at Bagnarea, a small town of Tuscany, in 1221; and his original name was *John Fidauze*. He took the habit of a monk of the order of St Francis in 1243, became doctor of Paris in 1255, and the next year general of his order. After the death of Clement IV. the cardinals disagreeing about the election of a new pope, engaged themselves by a solemn promise to elect him who should be named by Bonaventure, even though it should be himself; but he chose Theobald archdeacon of Liege, who was then in the Holy Land, and took the name of *Gregory X*. This pope, in return, in 1272, made him cardinal and bishop of Alba, and ordered him to assist at the second general council of Lyons, where he died in 1274. His works were printed at Rome in 8 vols folio.

BONAVISTA, an island in the Atlantic ocean, the most easterly and first discovered of the Cape de Verd islands. It is 20 miles long and 13 broad; has plenty of goats and cotton, and some indigo. The inhabitants are remarkable for slothfulness: they have a town and two roads where ships come to an anchor. W. Long. 23. 6. N. Lat. 16. 5.

BOND (John), a commentator on Horace and Persius, was born in Somersetshire in the year 1550, and educated at Winchester school. In 1569 he was entered a student of the university of Oxford, probably in the New college, of which he became either one of the clerks or one of the chaplains. He took his bachelor of arts degree in 1573, and that of master in 1579; soon after which he was appointed by his college, master of the free school in Taunton in Somersetshire. In this employment he continued many years with great reputation: but being at length weary of his laborious employment, he commenced physician, and we are told became eminent in that capacity. He died in the year 1612, possessed of several lands and

tenements in his neighbourhood; but whether acquired by the practice of physic, does not appear. He wrote,

1. *Commentarii in poemata 2. Horatii*, 8vo. 2. *Commentarii in sex satyras Persii*, Lond. 1614, 8vo.

BOND, in law, is a deed whereby the obligor obliges himself, his heirs, executors, and administrators, to pay a certain sum of money to another at a day appointed. If this be all, the bond is called a simple one, *simplex obligatio*. But there is generally a condition added, that if the obligor does some particular act, the obligation shall be void, or else shall remain in full force; as payment of rent; performance of covenants in a deed; or repayment of a principal sum of money borrowed of the obligee, with interest; which principal sum is usually one half of the penal sum specified in the bond. In case this condition is not performed, the bond becomes forfeited, or absolute at law, and charges the obligor while living; and after his death the obligation descends upon his heir, who (on defect of personal assets) is bound to discharge it, provided he has real assets by descent as a recompense.

If the condition of a bond be impossible at the time of making it, or be to do a thing contrary to some rule of law that is merely positive, or be uncertain, or insensible, the condition alone is void, and the bond shall stand single and unconditional: for it is the folly of the obligor to enter into such an obligation from which he can never be released. If it be to do a thing that is *malum in se*, the obligation itself is void: for the whole is an unlawful contract, and the obligee shall take no advantage from such a transaction. And if the condition be possible at the time of making it, and afterwards becomes impossible by the act of God, the act of law, or the act of the obligee himself, there the penalty of the obligation is saved: for no prudence or foresight of the obligor could guard against such a contingency. On the forfeiture of a bond, or its becoming single, the whole penalty was recoverable at law: but here the courts of equity interposed, and would not permit a man to take more than in conscience he ought, viz. his principal, interest, and expences, in case the forfeiture accrued by non-payment of money borrowed; the damages sustained upon non-performance of covenants; and the like. And the statute 4 and 5 Ann. c. 16. hath also enacted, in the same spirit of equity, that in case of a bond, conditioned for the payment of money, the payment or tender of the principal sum due, with interest and costs, even though the bond be forfeited and a suit commenced thereon, shall be a full satisfaction and discharge.

BOND, in masonry and brick-laying, is when bricks or stones are as it were knit and interwoven; and when they lay, make *good bond*, they mean that the joints are not made over, or upon other joints; but reach at least six inches, both within the wall and on the surface, as the art of building requires.

BONDAGE, properly signifies the same with slavery, but in old law books is used for villenage (see VILLENAGE). Tenants in bondage paid kenots, and did fealty; they were not to fell trees in their own garden, without licence of the lord. The widow of a tenant in bondage held her husband's estate *quam diu vixerit sine marito*, "as long as she lived single."

BONDAGE by the Forelock, or *Bondagium per anteriores crines capitis*, was when a freeman renounced his liberty,

Bond,
Bondage.

Bondman liberty, and became slave to some great man: which was done by the ceremony of cutting off a lock of hair from the forehead, and delivering it to his lord; denoting that he was to be maintained by him for the future. Such a bondman, if he reclaimed his liberty, or were fugitive from his master, might be drawn again to his servitude by the nose; whence the origin of the popular menace to pull a man by the nose.

BONDMAN, in the English law, is used for a villain, or tenant in villenage*.—The Romans had two kinds of bond-men; one called *servi*, who were those either bought for money, taken in war, left by succession, or purchased by some other lawful acquisition; or else born of their *bondwomen*, and called *vernae*. We may add a third kind of bondmen mentioned by Justinian, called *adscriptii glebae*, or *agricensiti*; who were not bound to the person, but to the ground or place, and followed by him who had the land. These in our law are called *villains regardants*, as belonging to the manor or place.

* See Villain and Villenage.

BONE-ACE, a game at cards played thus: The dealer deals out two cards to the first hand, and turns up the third, and so on through all the players, who may be seven, eight, or as many as the cards will permit: he that has the highest card turned up to him carries the bone; that is, one half of the stake; the other half remaining to be played for. Again, if there be three kings, three queens, three tens, &c. turned up, the eldest hand wins the bone. But it is to be observed, that the ace of diamonds is bone-ace, and wins all other cards whatever. Thus much for the bone: and as for the other half of the stake, the nearest to 31 wins it; and he that turns up or draws 31 wins it immediately.

BONES, their origin, formation, composition, texture, variety, offices, &c. See **ANATOMY**, Part I.

From a discovery made by Mr Scheele, of a method of producing the phosphoric acid in large quantity from bones, it has been asserted, that this acid is naturally contained in the bones, united with a calcareous earth. From many experiments, however, it appears that no acid is naturally contained in calcined bones; nor can the acid of phosphorus be extracted from them but by means of the vitriolic acid: whence it seems propable, that the phosphoric acid in this case is produced by the combination of a certain quantity of earth with the vitriolic acid.—With regard to the earth of bones itself, it appears to be very different from the calcareous kind: it is much more soluble in the vitriolic acid, and may be precipitated from that or any other by means of the caustic volatile alkali, which cannot be done with the calcareous earth.

BONES Whitened for Skeletons. Two processes are described in the *Acta Hoffnienfis* for whitening bones. Professor Rau had a method of giving them a great degree of whiteness. By bare exposure to the air, sun, and rain, for a length of time, they become notably white; but the whitest bones, kept in rooms tainted with smoke or fuliginous vapours, grow in a little time yellowish, brownish, and unsightly. It is customary for the purification of bones, to boil them in alkaline liquors; which, by dissolving and extracting the superfluous fat, improve their whiteness.

BONES Hardened and Softened. Boerhaave observes,

that alkaline salts render bones harder and firmer, and that acids make them softer and more flexible. These effects succeed in certain circumstances, but not universally; for bones may be hardened and softened both by acids and by alkalis, according to the quantity of saline matter employed, and the manner in which it is applied. Newmann made bones harder and more compact by treating them with the strongest of the mineral acids; though, when the acid is in sufficient proportion, it destroys or dissolves them. In Papin's digester (a strong close vessel, in which the steam of boiling liquors is confined, and the fluid by this means made to undergo a greater degree of heat than it could otherwise sustain), the hardest bones are reduced in a short time, by the action of simple water, into a soft pap or jelly; and alkaline liquors produce this effect still sooner.

In the history of the French Academy for the years 1742 and 1743, there is an account that Mr Geoffroy produced before the academy a small ivory spoon, which, by long lying in mustard, was become flexible and transparent like horn; that Mr Fouchy saw an ivory spoon, which, by lying for a considerable time in milk, was become supple like leather; and that Mr Hunauld produced bones, which had been softened by steeping in vinegar, afterwards hardened to their natural state by steeping in water, and softened a second time by steeping in vinegar. Dr Lewis observed that the nitrous and marine acids diluted, and the acetous acid, make bones flexible and tough like leather; but that the diluted vitriolic acid, though it renders them notably soft, makes them at the same time brittle. It seems as if a great part of the earthy matter, which is the basis of the bone, and on which its hardness depends, was dissolved and extracted by the three first; whilst the latter, incapable of dissolving this kind of earth into a liquid form, only corrodes it into a kind of selenitic concrete, which remains intermixed in minute particles among the gelatinous matter. Dr Lewis did not find that the softened bones, whatever acid they were softened by, recovered their hardness by steeping in water. Slips of softened ivory, after lying above a month in water, continued nearly as soft as when they were taken out of the acid liquor.

There is a singular induration of bones produced by fire; the effects of which agent are here remarkably different according to its degree and the circumstances of its application. Bones exposed to a moderate fire, either in open vessels, or in contact with the burning fuel, becomes opaque, white, and friable throughout; and an increase of fire, after they have once suffered this change, renders them only more and more friable. But if they are urged at first with a strong fire, such as that in which copper or iron melts, they become hard, semitransparent, and sonorus, like the hard mineral stones. This curious experiment deserves to be further prosecuted.

Colouring of BONES. Bones may be stained of a variety of colours by the common dyeing infusions and decoctions of animal and vegetable substances. They are stained also, without heat, by metallic solutions; and by means of these may be spotted or variegated at pleasure. Thus, solution of silver in aquafortis gives a brown or black according to its quantity; solution of gold in aqua regia, or in spirit of salt, a fine purple;

Bones.

ple; solution of copper in the acetous acid, a fine green; and solution of the same metal in volatile alkalis, a blue, which at first is deep and beautiful, but changes, upon exposure to the air, into a green or bluish-green. If the bone is but touched with the two first solutions, and exposed to the air, it does not fail to acquire the colour in a few hours: In the two latter, it requires to be steeped for a day or longer in order to its imbibing the colour. In these and other cases where immersion for some time is necessary, the bone may be variegated, by covering such parts as are to remain white, with wax or any other matter that the liquor will not dissolve or penetrate.

Oeconomical Use of BONES. Bones are a very useful article, not only for making different kinds of toys, but likewise in several of the chemical arts; as, For making cast iron malleable, for absorbing the sulphur of sulphureous ores; for forming tests and cupels, or vessels for refining gold and silver with lead (burnt bones composing a mass of a porous texture, which absorbs the vitrified lead and other matters, while the unvitrescible gold and silver remain entire behind); for the preparation of milky glasses and porcelains; for the rectification of volatile salts and empyreumatic oils; and for making glue. The bones of different animals are not equally fit for these uses: even the glue, or gelatinous part of the bones of one animal is notably different both in quantity and cohesiveness from that of another.

The human skull bone, or cranium, the natural defence of the seat of sensation and perception in the noblest animal, has been recommended medicinally as a cure for epilepsies, deliria, and all disorders of the senses, from the same philosophy which ascribed antiasthmatic virtues to the lungs of the long-winded fox; and expected, because fowls are said to digest even small stones, that the skin of the gizzard, dried and powdered, would produce a similar effect in the human stomach. To such lengths of extravagance have the sons of physic been carried by the blind superstition of former ages!

BONES in the Funeral Solemnities of the Ancients.—Divers usages and ceremonies relating to the bones of the dead have obtained in different ages; as gathering them from the funeral pile, washing, anointing, and depositing them in urns, and thence into tombs; translating them, which was not to be done without the authority of the pontiffs; not to say worshipping of them, still practised to the bones of the saints in the Romish church. Among the ancients, the bones of travellers and soldiers dying in foreign countries were brought home to be buried; till, by an express S. C. made during the Italic war, it was forbid, and the soldiers bodies ordered to be buried where they died.

The Romans had a peculiar deity under the denomination of *Osifilago*, to whom the care of the induration and knitting of the human bones was committed; and who, on that account, was the object of the adoration of all breeding women.

Fossile or Petrified BONES, are those found in the earth, frequently at great depths in all the strata, even in the bodies of stones and rocks; some of them of a huge size, usually supposed to be the bones of giants, but more truly of elephants or hippopotami. It is supposed they were repositied in those strata when

all things were in a state of solution; and that they incorporated and petrified with the bodies where they happened to be lodged.

In the museum of the Russian Academy of Sciences, there is a vast collection of fossil bones, teeth, and horns, of the elephant, rhinoceros, and buffalo, which have been found in different parts of this empire, but more particularly in the southern regions of Siberia. Naturalists have been puzzled to account for so great a variety being found in a country where the animals of which they formerly made a part were never known to exist. It was the opinion of Peter, who, though he deserves to be esteemed a great monarch, was certainly no great naturalist, that the teeth found near Voronetz were the remains of elephants belonging to the army of Alexander the Great, who, according to some historians, crossed the Don, and advanced as far as Kostinka. The celebrated Bayer, whose authority carries greater weight in the literary world, conjectures, that the bones and teeth found in Siberia belonged to elephants common in that country during the wars which the Mongul monarchs carried on with the Persians and Indians; and this plausible supposition seems in some measure to be corroborated by the discovery of the entire skeleton of an elephant in one of the Siberian tombs. But this opinion, as Mr Pallas† very justly observes, is sufficiently refuted by the consideration, that the elephants employed in the armies of all India could never have afforded the vast quantities of teeth which have been discovered, not to mention those which it is justly to be presumed may still be buried. They have been already dug up in such plenty as to make a considerable article of trade. The same ingenious naturalist has given an ample description of these fossil bones, and has endeavoured to account for their origin. Upon examining those in the museum, he was led to conclude, that as these bones are equally dispersed in all the northern regions of Europe, the climate probably was in the earlier ages less severe than at present, and then possibly sufficiently warm to be the native countries of the elephant, rhinoceros, and other quadrupeds, now found only in the southern climates. But when he visited, during his travels, the spots where the fossil bodies were dug up, and could form a judgment from his own observations, and not from the accounts of others, he renounced his former hypothesis; and, in conformity with the opinions of many modern philosophers, asserted, that they must have been brought by the waters; and that nothing but a sudden and general inundation, such as the deluge, could have transported them from their native countries in the south, to the regions of the north. In proof of this assertion, he adds, that the bones are generally found separate, as if they had been scattered by the waves, covered with a stratum of mud evidently formed by the waters, and commonly intermixed with the remains of marine plants, and similar substances; instances of which he himself observed during his progress through Siberia, and which sufficiently prove that these regions of Asia were once overwhelmed with the sea.

We often find in the earth petrified bones, the greatest part of their gelatinous matter being extracted by the moisture, and a stony one introduced in its room. In some parts of France petrified bones are met with which

Bones.

† Nov.
Comm. De
Ossibus Sibe-
riae fossilibus,
p. 440.

Bones
||
Bonfadia.

which have no impregnation of copper. Hence, on being calcined in an open fire, a volatile salt is produced from the remains of their gelatinous principle, and the bone is tinged throughout of a fine greenish-blue colour, copper always striking a blue with volatile alkalis. The French turcoise stones are no other than these bones prepared by calcination: they are very durable, and bear to be worked and polished nearly in the same manner as glass; without the imperfection, inseparable from glassy bodies, of being brittle. See the article TURCOISE.

There have been lately discovered several enormous skeletons, five or six feet beneath the surface, on the banks of the Ohio, not far from the river Miume in America, 700 miles from the sea-coast. Some of the tusks are near seven feet long; one foot nine inches at the base, and one foot near the point; the cavity at the root or base, 19 inches deep. Besides their size, there are several other differences which will not allow the supposition of their having been elephants: the tusks of the true elephant have sometimes a very slight lateral bend; these have a larger twist, or spiral curve, towards the smaller end: but the great and specific difference consists in the shape of the grinding teeth; which, in these newly found, are fashioned like the teeth of a carnivorous animal; not flat and ribbed transversely on their surface like those of the modern elephant, but furnished with a double row of high and conic processes, as if intended to masticate, not to grind, their food. A third difference is in the thigh-bone, which is of great disproportionable thickness to that of the elephant; and has also some other anatomical variations. These fossil bones have been also found in Peru and the Brazils; and when cut and polished by the workers in ivory, appear in every respect similar. It is the opinion of Dr Hunter, that they must have belonged to a larger animal than the elephant; and differing from it, in being carnivorous. But as yet this formidable creature has evaded our search; and if, indeed, such an animal exists, it is happy for man that it keeps at a distance; since what ravage might not be expected from a creature, endowed with more than the strength of the elephant, and all the rapacity of the tiger? See MAMMOTH.

BONE-Spavin. See FARRIERY, § xxvi.

BON-ESPERANCE, the same with the Cape of Good Hope. See GOOD HOPE.

BONET (Theophilus), an eminent physician born at Geneva, March 15th 1620. He took his degree in physic in 1643, after he had gone through most of the famous universities, and was for some time physician to the duke of Longueville. Mean while his skill in his profession got him considerable practice; but being seized with deafness, it obliged him to retire from business, which gave him leisure to collect all the observations he had made during a practice of 40 years. He wrote, 1. *Polyalthes, sive Thesaurus Medico practico*, 3 vols folio. 2. *Labyrinthe Medici extricati*. 3. *Medicini Septentrionalis Collatitia*; and other works.

BONFADIO (James), one of the most polite writers of the 16th century, was born in Italy, near the lake Garda. He was secretary to the cardinal de Bari, and after his death to the cardinal Ghinucci. He afterwards read public lectures on Aristotle's politics, and on rhetoric; and was made historiographer to the re-

public of Genoa. He applied himself to compose the annals of that state, in which he wrote too satirically on some families. This creating him enemies who were resolved to ruin him, they accused him of the unnatural sin; and, as witnesses were found to convict him of it, he was condemned to be burnt. Some say that this sentence was executed; and others, that his punishment was changed, and that he was beheaded. This was in the year 1560. Upon the day of his execution he wrote a note to John Baptist Grimaldi, to testify his gratitude to the persons who had endeavoured to serve him; and promised to inform them how he found himself in the other world, if it could be done without frightening them. But it does not appear that he performed his promise, any more than the many who had promised the like before him.—His history of Genoa is esteemed. We have also some letters, some orations, and Latin and Italian poems, of his, which were printed at Bologna in the year 1744, octavo.

BONFINIUS (Anthony), flourished in the 15th century. He was a native of Ascoli in Italy, and attached himself to the study of the belles lettres. Matthias Cowin king of Hungary, having heard of his learning, sent for him, retained him, and settled upon him a pension. He wrote, 1. A history of Ascoli; 2. A treatise of virginity and conjugal chasticity; 3. An history of Hungary; and other works.

BONFRERIUS (James), a learned Jesuit, born at Dinant, in 1573. He wrote a commentary on the Pentateuch, and learned notes on the Onomasticon of the places and towns mentioned in the Scripture. He died at Tournay in 1643, aged 70.

BONGARS (James), in Latin *Bongarsias*, a native of Orleans, was one of the most learned men of the 16th century. He applied himself to the study of critical learning, and was for near 30 years employed in the most important negotiations of Henry IV. whose resident he was several times at the courts of the princes of Germany, and at length his ambassador. He was of the Protestant religion; and, when very young, had the courage to write and post up in Rome a very spirited answer to a bull of Pope Sixtus V. The public is obliged to him for the edition of several authors who have written the History of the expeditions to the Holy Land; he also published, among other works, an edition of Justin, in which he restored several passages that had been corrupted, by consulting valuable manuscripts, and added notes which explained many difficulties. He died in 1612, aged 58.

BONIFACE, the name of several eminent men, particularly of nine popes. To the first of these, who was chosen pope in 418, St Augustine dedicated his four books against the two epistles of the Pelagians. The third of that name prevailed upon the emperor Phocas to consent that the title of *Universal Bishop* should be conferred on no other than the bishop of Rome. Boniface IV. obtained from the same emperor, the pantheon, a famous heathen temple built by Agrippa, and converted it into a church which is now called "Our Lady della Rotunda." Several works are also attributed to him, but they appear to be spurious. Boniface VII. hath the title of *antipope*; because in 974 he caused Benedict VI. to be strangled in prison, and after the election of Benedict VII. removed the treasures of the church to Constantinople. He, however,

Bonfinius
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Boniface.

Boniface
||
Bonner.

however, at length returned after the death of Benedict, and caused his successor John XIV. to be murdered; but died himself soon after, and was dragged naked by the feet about the streets. Boniface VIII. canonized St Lewis in 1797, and in 1300 appointed the jubilee to be solemnized every 100 years after.

BONIFACE is also the name of a saint, who before he took that name was called *Winifred*, and was born at Kirton in Devonshire. He chose to go and preach the gospel among the barbarous nations; and though created archbishop of Mentz, soon after resigned his office, to go and preach in East Friesland, where he was killed by the Pagans on the 5th of June 754. His letters were published by Senarius.

BONIFACIO, a town in the island of Corsica, beyond the mountains, near the strait called *Bocca di Bonifacio*. It is well fortified, and pretty populous. E. Long. 9. 20. N. Lat. 41. 25.

BONIS NON AMOVENDIS, in law, is a writ directed to the sheriffs of London, &c. charging them that a person against whom judgment is obtained, and prosecuting a writ of error, be not suffered to remove his goods until the error is determined.

BONITO, in ornithology. See SCOMBER.

BONN, an ancient and strong city of Germany, in the electorate of Cologne, and the usual residence of the elector. It is of great consequence in the time of war; because it is situated on the Rhine, in a place where it can stop every thing that comes down that river. It is well fortified by the elector; who has a fine palace and beautiful gardens in the city. E. Long. 7. 5. N. Lat. 50. 44.

BONNA (anc. geog.), one of the 50 citadels built by Drusus on the Rhine; supposed by some to be the same with the *Ara Ubionum*: now *Bonn*.

BONNEFONS (John), a Latin poet born at Clermont in Auvergne, and lieutenant-general of Bar sur Seine, acquired great reputation by his *Pancharis*, and other poems. He died under the reign of Louis XIII. He ought not to be confounded with John Bonnefons his son, another Latin poet.

BONNER (Edmund), bishop of London, of infamous memory, was born at Hanley in Worcestershire, and generally supposed to be the natural son of one Savage a priest; and that priest was the natural son of Sir John Savage of Clifton in the same county. Strype, however, says, he was positively assured that Bonner was the legitimate offspring of a poor man, who lived in a cottage known to this day by the name of *Bonner's place*. About the year 1512, he entered student of Broadgate Hall in Oxford. In 1519, he was admitted bachelor of the canon and civil law. About the same time he took orders, and obtained some preferment in the diocese of Worcester. In 1525, he was created doctor of canon law. Having now acquired the reputation of a shrewd politician and civilian, he was soon distinguished by Cardinal Wolsey, who made him his commissary for the faculties, and heaped upon him a variety of church-preferments. He possessed at the same time the livings of Blaydon and Cherry-Burton in Yorkshire, Ripple in Worcestershire, east Derham in Norfolk, prebend of St Paul's, and the archdeaconry of Leicester. Bonner was with the cardinal at Caw-wood, when he was arrested for high treason. After the death of that minister, he soon found means

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Bonner
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Bonnet.

to insinuate himself into the favour of Henry VIII. who made him one of his chaplains, and employed him in several embassies abroad, particularly to the pope. In 1532, he was sent to Rome, with Sir Edward Kame, to answer for the king, whom his Holiness had cited to appear in person or by proxy. In 1533, he was again dispatched to Pope Clement VII. at Marseilles, upon the excommunication of King Henry on account of his divorce. On this occasion he threatened the pope with so much resolution, that his Holiness talked of burning him alive, or throwing him into a caldron of melted lead; upon which Bonner thought fit to decamp. His infallibility did not foresee that the man whom he thus threatened was predestined to burn heretics in England. In 1538, being then ambassador at the court of France, he was nominated bishop of Hereford; but, before consecration, was translated to the see of London, and enthroned in April 1540.—Henry VIII. died in 1547, in which time Bonner was ambassador with the emperor Charles V. During this reign he was constantly zealous in his opposition to the pope; and, in compliance with the king, favoured the reformation. Henry VIII. was not to be trifled with; but, on the accession of young Edward, Bonner refused the oath of supremacy, and was committed to the fleet; however, he soon thought fit to promise obedience to the laws, and was accordingly released. He continued to comply with reformation; but with such manifest neglect and reluctance, that he was twice reprimanded by the privy council, and in 1549, after a long trial, was committed to the Marshalsea, and deprived of his bishopric. The succeeding reign gave him ample opportunity of revenge. Mary was scarce seated on the throne before Bonner was restored to his bishopric; and soon after appointed vicegerent and president of the convocation. From this time he became the chief instrument of papal cruelty: he is said to have condemned no less than 200 Protestants to the flames in the space of three years. Nor was this monster of a priest more remarkable for his cruelty than his impudence. When Queen Elizabeth came to the crown, he had the insolence to meet her, with the rest of the bishops, at Highgate. In the second year of her reign, refusing to take the oath of allegiance and supremacy, he was again deprived, and committed to the Marshalsea; where he died in 1569, after ten years confinement. There cannot be a stronger instance of the comparative lenity of the Protestant church, than its suffering this miscreant to die a natural death. Several pieces were published under his name.

BONNESTBLE, a town of Le Maine in France, which carries on a great trade in corn. E. Long. 0. 30. N. Lat. 48. 11.

BONNET, in a general sense, denotes a cover for the head, in common use before the introduction of hats. Bonnets are still used in many parts of Scotland.

BONNET, in fortification, a small work consisting of two faces, having only a parapet with two rows of palisadoes, of about 10 or 12 feet distance; it is generally raised before the salient angle of the counterscarp, and has a communication with the covered way, by a trench cut through the glacis, and palisadoes on each side.

BONNET à Pretre, or Priest's Bonnet, in fortification, is an out-work, having at the head three salient angles,

Z z

Bonnet
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Bononcini.

angles, and two inwards. It differs from the double tenaille only in this, that its sides, instead of being parallel, are like the *queue d'aronde*, or swallow's tail, that is, narrowing, or drawing close at the gorge, and opening at the head.

BONNET, in the sea-language, denotes an addition to a sail; thus we say, lace on the bonnet, or shake off the bonnet.

BONNEVAL (Claudius Alexander count de), known in the latter part of his life by the name of *Osman Bashaw*, descended from a family related to the blood-royal of France, entered himself at the age of 16 in the service of that crown, and married the daughter of marshal de Biron. He made the campaign in Flanders in 1690; but soon after left the French army, and entered into the Imperial service under Prince Eugene, who honoured him with an intimate friendship. The intrigues of the marquis de Prié, his inveterate enemy, ruined his credit, however, at the court of Vienna, and caused him to be banished the empire. He then offered his service to the republic of Venice and to Russia; which being declined, his next tender was to the Grand Signior, who gladly received him; it was stipulated, that he should have a body of 30,000 men at his disposal; that a government should be conferred on him, with the rank of Bashaw of three tails, and a salary of 10,000 aspers a-day; and that, in case of a war, he should be commander in chief. The first expedition he engaged in after his arrival at Constantinople, was to quell an insurrection in Arabia Petrea, which he happily effected; and at his return had large offers made him by Kouli Khan, but he did not choose to accept them. Some time after, he commanded the Turkish army against the emperor, over whose forces he gained a victory on the banks of the Danube. But success does not always protect a person against disgrace; for Bonneval, notwithstanding his service, was first imprisoned, and then banished to the island of Chio. The sultan, however, continued his friend; and the evening before his departure made him bashaw-general of the Archipelago, which, with his former appointment of beglerbeg of Arabia, rendered him one of the most powerful persons in the Ottoman empire. In this island he found a retirement quite agreeable to his wishes; but did not long enjoy it, being sent for back, and made *topigi* or master of the ordnance, a post of great honour and profit. He died in this employment, aged 75, in 1747; and wrote the memoirs of his own life.

BONNEVAL, a town of France, in Beauce, with a fine Benedictine abbey. It is seated on the river Loire, in E. Long. 1. 30. N. Lat. 48. 10.

BONNEVILLE, a town of Savoy, situated on the north side of the river Arve, and subject to the king of Sardinia. E. Long. 6. 10. N. Lat. 46. 18.

BONNY, among miners, a bed of ore, differing only from a squat as being round, whereas the squat is flat. See SQUAT.

BONNY, a town of France, in the Gatinois, seated at the confluence of a river of the same name with the Loire. E. Long. 2. 54. N. Lat. 47. 36.

BONONCINI (Giovanni), an eminent composer of music, for some time divided the opinions of the *conoscenti* of this kingdom with respect to the comparative merits of himself and the great Handel, which gave

occasion for the following epigram, said to have been written by Dr Swift:

Some say that Signior Bononcini
Compar'd to Handel's a meer ninny;
Others aver, that to him Handel
Is scarcely fit to hold the candle.
Strange! that such high disputes should be
'Twixt *Tweedle Dum* and *Tweedle Dee*.

There is one opera (Italian) published with his name prefixed to it, intitled *Pharnaces*; but whether the words, or only the music, are his composition, is uncertain; and indeed, in the general, the language of those pieces written merely for musical representation, is so extremely paltry, and so opposite to every thing that can be deemed poetry, that the greatest compliment that can be paid to the authors of them is, to suffer their names to lie buried in the shades of obscurity.

BONONIA (anc. geog.), a town of Gallia Belgica, supposed to be the *Portus Iccius* of Cæsar, and the *Gessoriacum* of Mela, and to have had three different names, (Cluverius). Peutinger's map expressly calls *Gessoriacum Bononia*. Now *Boulogne*. E. Long. 1. 30. N. Lat. 50. 40.

BONONIA, a town of Italy, in the Gallia Cispadana; a name probably given by the Gauls, there being a *Bononia* in Gallia Belgica. Its ancient name, when in the hands of the Tuscans, who were expelled by the Gauls, was *Falsina*. In the 563d year of the city the Romans led a colony thither; which, about the beginning of the Actiac war, was increased by Augustus, and is the *Colonia Bononiensis* of Tacitus. Now *Bologna*; which see.

BONONIA, a town of Panonia Inferior, between Murfa to the north-west, and Taurinum to the east.—Another Bononia, a town of Mœsia Superior, on the Danube; now *Bodon* in Bulgaria. See BODON.

BONONIAN. See BOLONIAN.

BONOSIANI, or BONOSIACI, an ancient branch of *Adoptiani*, in the fourth century, denominated from their leader Bonofus, a bishop of Macedonia. The Bonosiani were prior to the Feliciani, and even to Nestorius; whence some rather consider them as a branch of Arians. They allowed Christ to be no otherwise the Son of God than by adoption.

BONPOURNICKEL, a coarse kind of bread used in Westphalia. See BREAD.

BONS-HOMMES, or *Bon-hommes*, a sort of hermits of St Augustin, founded by F. de Paula. They were brought over into England in 1283, by Edmund earl of Cornwall, and settled at Ashorug in Bucks, besides which they had only one house more at Edingdon in Wiltshire. They followed the rule of St Austin, and wore a blue habit. The name is said to have arisen from Louis XI. of France who used to call F. de Paula, prior of the order, *Le bon homme*. Till then they had been called the *Minimi*, or the order of Grammont. See ALBIGENSES.

BONTIA, WILD OLIVE OF BARBADOES: A genus of the angiospermia order, belonging to the didynamia class of plants; and in the natural method ranking under the 40th order, *Personate*. The calyx is quinquepartite; the corolla is bilabiated, the inferior lip tripartite and revolute; the plum is ovate and monospermous, with the apex turned to one side.

Of

Bononia
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Bontia.

Bonvincino

||
Bonzes.

Of this genus there are two species, the daphnoides and the germinans. The first hath a woody stem and branches; rising to the height of ten feet, with narrow, smooth, thickish leaves, crenated at the edges; and flowers from the sides of the branches, succeeded by large oval fruit that sometimes ripen in England. This species is greatly cultivated in the gardens at Barbadoes for making of hedges; for which purpose it is exceedingly proper, it being an evergreen of very quick growth. It is said, that from cuttings planted there in the rainy season, when they have immediately taken root, there has been a complete hedge, four or five feet high, in 18 months. The second sort has been reckoned by many botanic writers to be a species of the mangrove tree, as it grows in swamps, which they also do. It rises 14 or 16 feet high, sending out several small branches which incline downward toward the water, and as soon as they reach that, put out roots into the mud, whereby they propagate very fast: these branches are garnished with leaves placed opposite; they are of a thick substance like those of the bay tree about two inches long and one broad, very smooth on their surface: the flowers are white, and come out in spikes from the upper branches. This hath been also by some supposed to be the plant which produces the *Malacca-BEAN* formerly kept in the shops. These plants are easily propagated, either by seeds or cuttings, sown or planted on a hot-bed; but they must be kept constantly in the stove.

BONVINCINO, called Le MORETTO, (Alessandro), history and portrait painter, was born at Rovate in 1514. He was first the disciple of Titian, under whose direction he studied diligently for some years. But, having accidentally seen the designs of Raphael, he felt an elevation of mind that he never had before experienced. He therefore gave himself up entirely to study those master-pieces of art and genius; and his observations were guided with such judgment, as well as attention, that his improvement was truly surprising, and he became an exceeding good painter. His works were eagerly bought up, as being extremely admired for the tenderness of the penciling; for the correctness and spirited expression of the figures; for the neatness of the finishing; and for the rich variety of his draperies, which usually consisted of velvets, damasks, or sattins, all copied after nature, and being wonderfully imitated. He was also equally excellent in portrait, and by many was placed in competition even with Titian. He died in 1564.

BONUS HENRICUS. See CHENOPODIUM.

BONZES, Indian priests. The Tonquinese have a pagod or temple in each town; and each pagod has at least two bonzes belonging to it: some have 30 or 40. These bonzes, in order to distinguish themselves from the laity, wear a chaplet about their necks consisting of 100 beads; and carry a staff, at the end of which is a wooden bird. They live upon the alms of the people; yet are very charitably disposed, and maintain several orphans and widows out of their own collections.

The bonzes of China are the priests of the Fohists or sect of Fohi. It is one of their established tenets that there are rewards allotted for the righteous, and punishments for the wicked, in the next world; and that there are various mansions in which the souls of

men will reside, according to their different degrees of merit. But, in order to deserve the favour of heaven, the bonzes instruct the people to treat the priests with respect and reverence, to support and maintain them, and to erect temples and monasteries for them. They tell them, that, unless they comply with these injunctions, they will be cruelly tormented after death, and pass through a disagreeable variety of transmigrations: in short, that they will be changed into mules, asses, rats, and mice.

The Chinese bonzes, according to F. le Compte, are no better than a gang of dissolute idle fellows. All their aim is to incite people to commiserate their abject condition: to which end they have recourse to several tricks and impostures. When the common arts of address fail them, they try what public acts of penance will do. Some of them drag heavy chains 30 feet long after them; some sit in the highway knocking their heads against flint stones; others set particular drugs on fire upon their heads: all these are several ways of drawing the attention and exciting the compassion of the people, and they seldom fail of success.

The bonzes of Japan are, for the generality, gentlemen of the highest extraction; for when a gentleman of quality finds his family grow too numerous, nay, when he has only two sons, he generally makes the youngest a bonze, to prevent all domestic broils and confusions. These priests are dressed in various colours; their apartments are very commodious, and situated in the healthiest parts of the country.

F. Navarette tells us, that the bonzes are obliged to chastity; and that, on the 2d of April 1667, a petty king of Canton had condemned 11 of them to be burnt alive for incontinence. He adds, that it was reported of an empress of the last reigning family, who had a particular kindness for the bonzes, that she granted them a dispensation for the use of women during three days. The bonzes of China, according to the same author, are computed at 50,000.

BOOBY, in ornithology. See PELICANUS.

BOOK, the general name of almost every literary composition; but, in a more limited sense, is applied only to such compositions as are large enough to make a volume. As to the origin of books or writing, those of Moses are undoubtedly the most ancient that are extant: But Moses himself cites many books which it behoved to be written before his time.

Of profane books, the oldest extant are Homer's poems, which were so even in the time of Sextus Empiricus; though we find mention in Greek writers of seventy others prior to Homer; as Hermes, Orpheus, Daphne, Horus, Linus, Musæus, Palamedes, Zoroaster, &c.: but of the greater part of these there is not the least fragment remaining; and of others, the pieces which go under their names are generally held, by the learned, to be supposititious.

Several sorts of materials were used formerly in making books: Plates of lead and copper, the barks of trees, bricks, stone, and wood, were the first materials employed to engrave such things upon as men were willing to have transmitted to posterity. Josephus speaks of two columns, the one of stone, the other of brick, on which the children of Seth wrote their inventions and astronomical discoveries: Porphyry makes

Bonzes

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Book.

Book.

mention of some pillars, preserved in Crete, on which the ceremonies preserved by the Corybantes in their sacrifices were recorded. Hesiod's works were originally written upon tables of lead, and deposited in the temple of the Muses, in Bœotia: The ten commandments, delivered to Moses, were written upon stone; and Solon's laws upon wooden planks. Tables of wood, box, and ivory, were common among the ancients: When of wood, they were frequently covered with wax, that people might write upon them with more ease, or blot out what they had written. The leaves of the palm-tree were afterwards used instead of wooden planks, and the finest and thinnest part of the bark of such trees, as the lime, the ash, the mapple, and the elm; from hence comes the word *liber*, which signifies the inner bark of the trees: and as these barks are rolled up, in order to be removed with greater ease, these rolls were called *volumen*, a volume; a name afterwards given to the like rolls of paper or parchment.

Thus we find books were first written on stones, witness the Decalogue given to Moses: Then on the parts of plants; as leaves, chiefly of the palm-tree, the rind and barks, especially of the tilia, or phillyrea, and the Egyptian papyrus. By degrees wax, then leather, were introduced, especially the skins of goats and sheep, of which at length parchment was prepared: then lead came into use; also linen, silk, horn, and lastly paper itself.

The first books were in the form of blocks and tables; but as flexible matter came to be wrote on, they found it more convenient to make their books in the form of rolls: These were composed of several sheets fastened to each other, and rolled upon a stick, or *umbilicus*; the whole making a kind of column, or cylinder, which was to be managed by the umbilicus as a handle, it being reputed a crime to take hold of the roll itself: The outside of the volumn was called *frons*; the ends of the umbilicus, *cornua*, which were usually carved, and adorned with silver, ivory, or even gold and precious stones: The title *συλλαβος*, was struck on the outside; the whole volume, when extended, might make a yard and a halfe wide, and fifty long. The form which obtains among us is the square, composed of separate leaves; which was also known, tho' little used, by the ancients.

To the form of books belongs also the internal œconomy, as the order and arrangement of points and letters into lines and pages, with margins and other appurtenants. This has undergone many varieties. At first the letters were only divided into lines; then into separate words; which by degrees were noted with accents, and distributed, by points and stops, into periods, paragraphs, chapters, and other divisions. In some countries, as among the orientals, the lines began from the right and ran leftward; in others, as the northern and western nations, from left to right; others, as the Greeks, followed both directions, alternately going in the one, and returning in the other, called *boustrophædon*: In most countries, the lines run from one side to the other; in some, particularly the Chinese, from top to bottom.

Multitude of Books has been long complained of: the complaint is as old as Solomon, who lived three thousand years ago: they are grown too numerous not only to procure and read, but to see, to learn the names

of, or even to number. England has more to fear on this score than other countries; since, besides our own produce, we have for some years past drained our neighbours. However, as bishop Caramuel's scheme miscarried, which was to write about an hundred volumes in folio, and then prevail on the civil and military powers to oblige all their subjects to read them, we need not much regret the multitude of books.

As knowledge, however, is naturally advantageous, and as every man ought to be in the way of information, even a superfluity of books is not without its use, since hereby they are brought to obtrude themselves on us, and engage us when we had least design. This advantage, an ancient father observes, we owe to the multiplicity of books on the same subject, that one falls in the way of one man, and another best suits the level or the apprehension of another. "Every thing that is written (says he) does not come into the hands of all persons: perhaps some may meet with my books, who may hear nothing of others which have treated better of the same subject. It is of service, therefore, that the same questions be handled by several persons, and after different methods, though all on the same principles, that the explications of difficulties and arguments for the truth may come to the knowledge of every one by one way or other." Add, that the multitude is the only security against the total loss or destruction of books: it is this that has preserved them against the injuries of time, the rage of tyrants, the zeal of prosecutors, and the ravages of barbarians; and handed them down, through long intervals of darkness and ignorance, safe to our days. *Solaque non norunt hæc monumenta mori.*

Scarcity of Books. Of the scarcity and value of books during the seventh and many subsequent centuries, the following curious account is given by Mr Warton in his history of English Poetry, Vol. I.

"Towards the close of the seventh century (says he), even in the papal library at Rome, the number of books was so inconsiderable, that pope Saint Martin requested Sanctamand bishop of Maestricht, if possible, to supply this defect from the remotest parts of Germany. In the year 855, Lupus, abbot of Ferrieres in France, sent two of his monks to Pope Benedict III. to beg a copy of *Cicero de Oratore*, and Quintilian's *Institutes*, and some other books: 'for (says the abbot) although we have part of these books, yet there is no whole or complete copy of them in all France.' Albert, abbot of Gemblours, who with incredible labour and immense expence had collected an hundred volumes on theological, and fifty on profane, subjects, imagined he had formed a splendid library. About the year 790, Charlemagne granted an unlimited right of hunting to the abbot and monks of Sithin, for making their gloves and girdles of the skins of the deer they killed, and covers for their books. We may imagine that these religious were more fond of hunting than reading. It is certain that they were obliged to hunt before they could read: and at least it is probable, that under these circumstances, and of such materials, they did not manufacture many volumes. At the beginning of the tenth century books were so scarce in Spain, that one and the same copy of the bible, Saint Jerom's epistles, and some volumes of ecclesiastical offices and martyrologies, often served several different

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monasteries. Among the constitutions given to the monks of England by archbishop Lanfranc, in the year 1072, the following injunction occurs. At the beginning of Lent, the librarian is ordered to deliver a book to each of the religious: a whole year was allowed for the perusal of this book; and at the returning Lent, those monks who had neglected to read the books they had respectively received, are commanded to prostrate themselves before the abbot, and to supplicate his indulgence. This regulation was partly occasioned by the low state of literature which Lanfranc found in the English monasteries. But at the same time it was a matter of necessity, and is in great measure to be referred to the scarcity of copies of useful and suitable authors. In an inventory of the goods of John de Pontiffara, bishop of Winchester, contained in his capital palace of Wolvesey, all the books which appear are nothing more than *Septendecem pecie librorum de diversis scientiis*. This was in the year 1294. The same prelate, in the year 1299, borrows of his cathedral convent of St Swithin at Winchester, *Bibliam bene glossatam*; that is, the Bible with marginal Annotations, in two large folio volumes; but gives a bond for due return of the loan, drawn up with great solemnity. This Bible had been bequeathed to the convent the same year by Pontiffara's predecessor, bishop Nicholas de Ely: and in consideration of so important a bequest, that is *pro bona Biblia dicti episcopi bene glossata*, and one hundred marks in money, the monks founded a daily mass for the soul of the donor. When a single book was bequeathed to a friend or relation, it was seldom without many restrictions and stipulations. If any person gave a book to a religious house, he believed that so valuable a donation merited eternal salvation; and he offered it on the altar with great ceremony. The most formidable anathemas were peremptorily denounced against those who should dare to alienate a book presented to the cloister or library of a religious house. The prior and convent of Rochester declare, that they will every year pronounce the irrevocable sentence of damnation on him who shall purloin or conceal a Latin translation of Aristotle's Physics, or even obliterate the title. Sometimes a book was given to a monastery on condition that the donor should have the use of it during his life; and sometimes to a private person, with the reservation that he who receives it should pray for the soul of his benefactor. The gift of a book to Lincoln cathedral, by bishop Repingdon, in the year 1422, occurs in this form, and under these curious circumstances. The memorial is written in Latin, with the bishop's own hand, which I will give in English, at the beginning of Peter's Breviary of the Bible. 'I Philip of Repyndon, late bishop of Lincoln, give this book, called *Peter de Aureo-lis*, to the new library to be built within the church of Lincoln: reserving the use and possession of it to Richard Tryfely, clerk, canon, and prebendary, of Mil-toun, in fee, and to the term of his life; and afterwards to be given up and restored to the said library, or the keepers of the same, for the time being, faithfully, and without delay. Written with my own hand. A. D. 1422.' When a book was bought, the affair was of so much importance, that it was customary to assemble persons of consequence and character, and to make a formal record that they were present on this occasion.

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Book.

Among the royal manuscripts, in the book of the Sentences of Peter Lombard, an archdeacon of Lincoln has left this entry. 'This book of the Sentences belongs to master Robert archdeacon of Lincoln, which he bought of Geoffrey the chaplain, brother of Henry vicar of Northelkington, in the presence of master Robert de Lee, master John of Lirling, Richard of Luda clerk, Richard the almoner, the said Henry the vicar, and his clerk, and others: and the said archdeacon gave the said book to God and saint Oswald, and to Peter abbot of Barton, and the convent of Barden.' The disputed property of a book often occasioned the most violent altercations. Many claims appear to have been made to a manuscript of Matthew Paris, belonging to the last mentioned library; in which John Russel, bishop of Lincoln, thus conditionally defends or explains his right of possession. 'If this book can be proved to be or to have been the property of the exempt monastery of St Alban in the diocese of Lincoln, I declare this to be my mind, that in that case I use it at present as a loan under favour of those monks who belong to the said monastery. Otherwise, according to the condition under which this book came into my possession, I will that it shall belong to the college of the blessed Winchester Mary at Oxford, of the foundation of William Wykham. Written with my own hand at Buckdane, 1st Jan. A. D. 1488. Jo. Lincoln. Whoever shall obliterate or destroy this writing, let him be anathema.' About the year 1225, Roger de Insula, dean of York, gave several Latin bibles to the university of Oxford, with a condition that the students who perused them should deposit a cautionary pledge. The library of that university, before the year 1300, consisted only of a few tracts, chained or kept in chests in the choir of St Mary's church. In the year 1327, the scholars and citizens of Oxford assaulted and entirely pillaged the opulent Benedictine abbey of the neighbouring town of Abingdon. Among the books they found there, were one hundred psalters, as many grayles, and 40 missals, which undoubtedly belonged to the choir of the church: but besides these, there were only twenty-two codices, which I interpret books on common subjects. And although the invention of paper, at the close of the eleventh century, contributed to multiply manuscripts, and consequently to facilitate knowledge, yet, even so late as the reign of our Henry VI. I have discovered the following remarkable instance of the inconveniences and impediments to study, which must have been produced by a scarcity of books. It is in the statutes of St Mary's college at Oxford, founded as a seminary to Osney abbey in the year 1446: 'Let no scholar occupy a book in the library above one hour, or two hours at most, so that others be hindered from the use of the same.' The famous library established in the university of Oxford by that munificent patron of literature Humphrey Duke of Gloucester contained only 600 volumes. About the commencement of the 14th century there were only four classics in the royal library of Paris. These were one copy of Cicero, Ovid, Lucan, and Boethius. The rest were chiefly books of devotion, which included but few of the fathers: many treatises of astrology, geomancy, chiromancy, and medicine, originally written in Arabic, and translated into Latin or French: pandects, chronicles, and romances. This

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collection was principally made by Charles V. who began his reign in 1365. This monarch was passionately fond of reading; and it was the fashion to send him presents of books from every part of the kingdom of France. These he ordered to be elegantly transcribed and richly illuminated; and he placed them in a tower of the Louvre, from thence called *La Tour de la Librairie*. The whole consisted of 900 volumes. They were deposited in three chambers; which on this occasion were wainscotted with Irish oak, and cieled with cypress curiously carved. The windows were of painted glass, fenced with iron bars and copper wire. The English became masters of Paris in the year 1425; on which event the Duke of Bedford, regent of France, sent the whole library, then consisting of only 853 volumes, and valued at 2223 livres, into England; where perhaps they became the ground-work of Duke Humphrey's library just mentioned. Even so late as the year 1471, when Louis XI. of France borrowed the works of the Arabian physician Rhasis from the faculty of medicine at Paris, he not only deposited, by way of pledge, a quantity of valuable plate, but was obliged to procure a nobleman to join with him as surety in a deed, by which he bound himself to return it under a considerable forfeiture. The excessive prices of books in the middle ages afford numerous and curious proofs. I will mention a few only. In the year 1174, Walter, prior of St Swithin's at Winchester, afterwards elected abbot of Westminster, a writer in Latin of the lives of the bishops who were his patrons, purchased of the monks of Dorchester in Oxfordshire, Bede's Homilies and St Austin's Psalter, for twelve measures of barley, and a pall on which was embroidered in silver the history of St Birinus converting a Saxon king. Among the royal manuscripts in the British museum there is Comestor's Scholastic History in French; which as it is recorded in a blank page at the beginning, was taken from the king of France at the battle of Poitiers; and being purchased by William Montague Earl of Salisbury for 100 marcs, was ordered to be sold by the last will of his countess Elizabeth for 40 livres. About the year 1400, a copy of John of Meun's *Roman de la Rose* was sold before the palace-gate at Paris for 40 crowns, or L.33 : 6 : 6."

Books, burning of, was a kind of punishment much in use among the Romans, by legal sentence: sometimes the care of the execution was committed to *triumviri* appointed on purpose; sometimes to the prætors, and sometimes to the ædiles. Labienus, whom from his satirical spirit some have called *Rabienus*, is said to have been the first who underwent the severity of it. His enemies procured a *senatusconsultum*, whereby all his books published during seven years were ordered to be collected and burnt. "The thing (says Seneca) then appeared new and strange, to take revenge on learning!" *Res nova & infueta! supplicium de studiis sumi.* Cassius Servius, a friend of Labienus, hearing the sentence pronounced, cried aloud, "That they must burn him too, since he had got all the books by heart:" *Nunc me vivum uri oportet, quia illos didici.* Labienus could not survive his books, but shutting himself up in the tomb of his ancestors, pined away, and was buried alive. Divers other ancient testimonies concerning the burning of books are given in Reimm. Idea Syst. Antiq. Liter. p. 389.

Book.

Book is also used for a part or division of a volume or large work. In this sense we say, the *book of Genesis*, the *first book of Kings*, the *five books of Moses*, &c. The Digest is contained in fifty books, the Code in twelve books.

Books are usually subdivided into chapters, sometimes into sections or paragraphs: accurate writers quote chapter and book.

Everlasting Book.—We find in Signior Castaquo's account of the asbestus, a scheme for the making of a book, which, from its imperishable nature, he is for calling the *book of eternity*. The leaves of this book were to be of the asbestus paper, the covers of a thicker sort of work of the same matter, and the whole sowed with thread spun from the same substance. The things to be commemorated in this book were to be written in letters of gold; so that the whole matter of the book being incombustible, and everlastingly permanent against the force of all the elements, and subject to no changes from fire, water, or air, must remain for ever, and always preserve the writing committed to it. He carried this project so far towards execution, as to find a way of making a sort of paper from the asbestus, which was so tractable and soft, that it very well resembled a thin parchment; this, by the same process, was capable of being thickened or thinned at pleasure, and in either state equally resisted the fire. The covering of the thinnest kind of this paper with fire, only makes it red hot and very clear, the fire seeming to pass through it without wasting or altering any part of it. Copper, iron, or any other metal except gold or silver, exposed to the same degree of fire in the same thin plates, would be found not to bear it in this manner, but to scale, and burn it into scorix at the surface, which this stone does not.

Book-Binding. The art of gathering together and sewing the sheets of a book, and covering it with a back, &c." It is performed thus: The leaves are first folded with a folding-stick, and laid over each other in the order of the signature; then beaten on a stone with an hammer, to make them smooth and open well; and afterwards pressed. They are sewed upon bands, which are pieces of cord or packthread; six bands to a folio book; five to a quarto, octavo, &c.; which is done by drawing a thread through the middle of each sheet, and giving it a turn round each band, beginning with the first and proceeding to the last. After this the books are glued, and the bands opened and scraped, for the better fixing the pasteboards; the back is turned with a hammer, and the book fixed in a press between two boards, in order to make a groove for fixing the pasteboards; these being applied, holes are made for fixing them to the book, which is pressed a third time. Then the book is at last put to the cutting press, betwixt two boards; the one lying even with the press, for the knife to run upon; the other above it, for the knife to run against: after which the pasteboards are squared.

The next operation is the sprinkling the leaves of the book; which is done by dipping a brush into vermilion and sap-green, holding the brush in one hand, and spreading the hair with the other; by which motion the edges of the leaves are sprinkled in a regular manner, without any spots being bigger than the other.

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Book.

Then remains the covers, which are either of calf-skin or of sheep-skin: these being moistened in water, are cut out to the size of the book; then smeared over with paste made of wheat-flour; and afterwards stretched over the pasteboard on the outside, and doubled over the edges withinside; after having first taken off the four angles, and indented and platted the cover at the head-band: which done, the book is covered, and

bound firmly between two bands, and then set to dry. Afterwards it is washed over with a little paste and water, and then sprinkled with a fine brush, unless it should be marbled; when the spots are to be made larger by mixing the ink with vitriol. After this the book is glazed twice with the white of an egg beaten, and at last polished with a polishing iron passed hot over the glazed cover.

Book.

B O O K - K E E P I N G,

IS the art of recording mercantile transactions in a regular and systematic manner.

1. A merchant's books should contain every particular which relates to the affairs of the owner. They should exhibit the state of all the branches of his business, the connection of the different parts, the amount and success of the whole. They should be so full and so well arranged, as to afford a ready information in every point for which they may be consulted.

The matter which the books should contain is comprehended under the three following heads: First, The debts which are owing to the owner, and the debts which he owes to others. Secondly, The goods and other articles of property which belonged to him; the quantity and value sold, or otherwise disposed of; and the quantity and value which still remain in his possession. Thirdly, The amount of his stock when the books were opened; the profits he has obtained, and the losses he has suffered, since; and the amount of his stock at present.

That method of book-keeping which answers these purposes most clearly and concisely, is the best. The Italian method, by *double entry*, is generally preferred; at least, it is founded upon the most universal principles, and is the most convenient in extensive and complicated business: and the accountant who understands it, will find little difficulty in following, or even in inventing, other methods that are better accommodated to any particular purpose.

The Italian method requires three principal books; the Waste-Book, Journal, and Leger.

SECT. I. Of the WASTE-BOOK.

2. The waste-book, or day-book, contains an exact register of all occurrences in business in the same order as they take place. It begins with an inventory of every thing belonging to the owner, a list of the debts due to him, and of the debts he owes to others: It is carried on with a full relation of all the money he receives or pays; of all the goods he buys or sells; and of every other occurrence in his business. Each article should be entered as soon as the transaction takes place, and should be clearly expressed in the plainest language. It should require no supply from the accountant's memory, but should be fully intelligible to any person, however unacquainted with the business; at the same time, it should be written with all convenient brevity; and, therefore, sometimes refers to invoices and other accounts, for particulars. The accountant's first care should be to have nothing defect-

ive or ambiguous; his second, to have nothing superfluous.

3. The date is written in text on the top of each page. The articles are separated from each other by a line; and the transactions of one day are separated from those of another by a double line, in the middle of which there is left a blank space for inserting the day of the month. This book must be kept with the greater care, as it contains the materials from which the other books are composed; and any error or defect will occasion a like one in the others. Besides, it is the book whose authority is trusted to, and which must be exhibited to judges, or arbiters, when an account is disputed. As the journal is filled up from the waste-book, the authority of the former is esteemed more authentic, unless there be an obvious mistake through hurry; and either of these books is depended on rather than the leger, which, from its form, is more liable to error, and may be more easily vitiated by a fraudulent design.

4. As the waste-book contains the whole substance of the business, it may be applied so as to afford any information that can be wanted: but the labour of consulting it would be very great. For instance, if it were required to know how much any person owes us, we must look over the book from the beginning, and mark down every article in which we have dealt with him; or, if it were required to know what quantity of goods we should have on hand, we must look over the whole book, and mark down every article bought or sold. This operation would not only be found very tedious, but much exposed to the risk of omissions. To prevent these inconveniences, another book is used, in which the articles are arranged in a methodical order. This book is called the *Leger*, and we shall consider it next; because the journal, though it comes before it in the order of writing, cannot be well understood, till the nature of the leger be explained.

SECT. II. Of the LEGER.

5. In the leger, articles of the same kind are collected together; and, for that purpose, it is divided into many accounts, under which the different branches of business are arranged. Each account is introduced by a proper title, to explain the nature of the articles it contains; and articles of opposite kinds, which belong to the same account, are placed on the opposite pages of the same folio: for instance, money received on the one side, and money paid on the other; or goods bought on the one side, and goods sold on the other. The left-hand

hand page is called the *Debtor* or *Dr.* side of the account, and the right-hand page the *Creditor* or *Cr.* side. The difference between the sums of the *Dr.* and *Cr.* sides is called the *Balance*.

Accounts in the ledger are of three kinds, which answer to the three purposes of book-keeping mentioned § 1.

6. First, Personal Accounts. It is necessary to open an account for every person or company with whom there are any dealings on credit. At opening the books, if they be indebted to the owner, the debt is entered on the *Dr.*; but, if he be indebted to them, it is entered on the *Cr.* During the course of the business, goods sold on trust, money paid, and every thing for which they are accountable to him, is entered on the *Dr.*; but goods bought on trust, money received, and every thing for which he is accountable to them, is entered on the *Cr.* The balance shows how much they owe him, when the *Dr.* side is greatest; and how much he owes them, when the *Cr.* side is greater.

7. Secondly, Real accounts. By this we understand accounts of property of whatever kind, such as ready money, goods, houses, lands, ships, shares in public companies, and the like.

The account of ready money is intitled *Cash*. On the *Dr.* side, the money on hand at opening the books is entered, and afterwards every article of money received. On the *Cr.* side, there is entered every article of money paid out; and the balance shows how much ought to be on hand. The sum of the *Dr.* side of this account is always greater than that of the *Cr.* side.

8. Accounts of goods are generally ruled with inner columns for entering the quantities. When the books are opened, the goods on hand are entered on the *Dr.* side of the respective accounts; the quantities being placed in the inner, and the values in the outer column. Goods bought are entered in the same manner, and goods sold are entered on the *Cr.* side; the quantities and values being placed in the proper columns. Charges laid out on goods are entered on the *Dr.* side; and, when an incidental advantage arises from them, such as public bounty, it is entered on the *Cr.*

If the sums of the inner columns on the opposite sides be equal, it shows that the goods are all sold, and then the balance of the money-column shows the gain or loss. If the *Cr.* side be greater, it is gain; if the *Dr.* side be greater, it is loss. If the sum of the inner column be greater on the *Dr.* side, it shows that part of the goods are on hand; and their value must be added to the sum of the *Cr.* side, in order to determine the gain or loss.

9. If there be two or more kinds of the same sort of goods, they may be entered in the same account, allowing as many inner columns as there are kinds, and entering the quantities of each kind in the inner column reserved for it. This method exhibits the gain or loss on the whole goods; but does not show how much of it arises from each kind.

Or, a separate account may be opened for each kind, distinguishing the titles by the qualities, or by some other mark. Thus, one account may be kept for fine linen, another for coarse linen; one for port-wine crop 1787, another for port-wine crop 1788; one for rum from Jamaica, another for rum from Barbadoes. This method shows the gain or loss on each kind.

When there are more kinds than can be conveniently introduced in the same account, they may be divided into several classes, each class being placed in a separate account; and the particular kinds distinguished in inner columns. Thus the account of fine linen may be divided into several columns, for different kinds, distinguished by the number of threads in the breadth, or by any other convenient character.

10. Accounts of ships contain on the *Dr.* the value of the ship when the books are opened, and all expenses laid out thereon; on the *Cr.* all freights received. In like manner, accounts of houses or lands have the value of the subject, and all repairs, or other charges, entered on the *Dr.* and all rents or other profits received on the *Cr.* If the subject be sold in whole or in part, the sale is entered on the *Cr.* And the balance, after valuing the subject (if any) on hand, shows the gain or loss.

Accounts of property in the public funds, or shares in companies, public or private, contain the value, or money paid in, on the *Dr.* and the dividends received on the *Cr.* and are balanced as other real accounts.

Some persons open accounts for household furniture, plate, jewels, books, or the like. The entries on these accounts are made in the same manner.

In general, real accounts contain the value of the property, and all charges, on the *Dr.* and the sales and other returns on the *Cr.* When the account is to be balanced, if any property remains, the value thereof is placed on the *Cr.*; and then the balance shows the loss or gain, according as the *Dr.* or *Cr.* side is greatest.

11. Thirdly, Accounts of Stock, Profit and Loss, and its subsidiary accounts, which are sometimes called *fictitious accounts*.

The *Stock* account contains on the *Dr.* the amount of the debts which the owner owes when the books are opened; and on the *Cr.* the amount of ready money, goods, debts, and property of every kind belonging to him: therefore the balance shows what his nett stock is; or, in case of bankruptcy, how much his debts exceed his effects. There is nothing further entered on this account till the books are balanced: and then, if the business has yielded profit, the nett gain is entered on the *Cr.*; if it has been unsuccessful, the nett loss is entered on the *Dr.*: after which, the balance shows the nett stock at the time the books are closed.

12. The *Profit and Loss* account contains every article of gain on the *Cr.* and every article of loss on the *Dr.* The balance shows the nett gain or loss, and is transferred to the proper side of the stock-account, as mentioned above. This account is partly composed of articles that occur while the books are running. For example, legacies received are entered on the *Cr.* goods destroyed on the *Dr.* The rest of the articles are those of gain and loss, arising from the real accounts, which are collected when the books are balanced.

13. It has been found convenient to open several subsidiary accounts, in order to shorten and methodise that of profit and loss. These contain certain articles of gain or loss, which may be reduced under distinct heads. They are in effect so many parts of the profit and loss account, and their balances are entered on the proper side of that account when the books are closed. The chief of these accounts are the following.

The

Interest account, Which contains on the Dr. sums paid or incurred for interest; and on the Cr. sums received, or become due for the same.

Commission account, Which contains on the Cr. articles of gain received or owing us for our trouble in transacting business for others. There are seldom any entries on the Dr.

Charges merchandize, Which contains on the Dr. all charges paid or incurred on the business, which do not belong to any particular account, as shop-rent, public burdens for trade, clerks wages, postages, and the like. If any of these should afterwards be charged to some other account, the sum so charged is entered on the Cr.

Proper expenses, Which contains on the Dr. money or any thing else, withdrawn from the trade for our private use. There are seldom any entries on the Cr. The amount of this account, as well as the former, is not properly loss; but as it has the same effect in diminishing the stock, it is placed in the same manner to the Dr. of profit and loss.

Loss by bad debts, Which contains on the Dr. such debts as we reckon desperate; and on the Cr. any of these which may happen to be unexpectedly recovered.

Account of abatements, Which contains on the Dr. discounts allowed by us on payments received; on the Cr. discounts (if any) allowed to us on payments made. It is particularly useful in retail business, where discounts are often given, to show how much they amount to.

Insurance account, Which contains on the Cr. premiums received for making insurances; and, on the Dr. losses sustained on the same. There may be several accounts of this kind, such as insurance against sea-hazard, which is the most common; insurance against fire; insurance of lives; and insurance of debts. The balance shows the gain or loss which arises from being concerned in insurance.

More or fewer of these accounts may be used, according as the articles are frequent; and others may be invented to suit the purposes of the business which the books are kept for.

14. Every simple transaction in business belongs to two accounts, and must be entered on the Dr. of the one and on the Cr. of the other. Thus, when a person becomes indebted to us, the article he owes must be entered on the Dr. of his account; and, if it be for money paid him, it is also entered on the Cr. of cash; if for goods sold, it is entered on the Cr. of the account of goods; if for any thing delivered him by another person at our desire, it is entered on the Cr. of the deliverer's account; if for any wager or bargain, by which we are gainers, it is entered on the Cr. of profit and loss. Thus, in whatever way the debt arises, it is entered on the Cr. of some other account, as well as on the Dr. of the person's account who owes it.

In like manner, when we become indebted to any person, the article we owe must be entered on the Cr. of his account. If it be for money received, it is also entered on the Dr. of cash; if for goods bought, it is entered on the Dr. of the account of goods; if for any thing delivered to another person at our desire, it is entered on the Dr. of the receiver's account; and if it

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be in consequence of a losing bargain, it is entered on the Dr. of profit and loss.

Again, when goods are received, the transaction is entered on the Dr. of the account of goods. If they be bought for ready money, it is also entered on the Cr. of cash; if on trust, it is entered on the Cr. of the seller; if they be exchanged for other goods, it is entered on the Cr. of the goods delivered; if they be obtained by some profitable business, without any return, it is entered on the Cr. of profit and loss.

When goods are delivered, the transaction is entered on the Cr. of the account of goods; and, if they be sold for ready money, it is also entered on the Dr. of cash; if on credit, it is entered on the Dr. of the purchaser; if exchanged for other goods, it is entered on the Dr. of the goods received; and, if they be given gratis, or destroyed, it is entered on the Dr. of profit and loss.

Lastly, When any article of loss occurs, the transaction is entered on the Dr. of profit and loss; and as we must either pay it in money or goods, or remain indebted to some person for it, it must be entered on the Cr. of cash, or of goods delivered, or of the person intitled to receive it. And, when an article of gain occurs, it is entered on the Cr. of profit and loss, and also on the Dr. of cash or goods, if money or goods be received; and on the Dr. of the person accountable for it, if not immediately paid.

Thus, every article in any account, whether personal or real, or belonging to profit and loss, corresponds to some other article on the opposite of a different account. The same sum is entered on the Dr. of one account and on the Cr. of the other; and it follows from this, that, *If all the accounts in the ledger be added, the amount of the sums of the Dr. will be equal to those of the Cr.*

SECT. III. Of the JOURNAL.

15. THE journal is a fair record of all the transaction compiled from the waste-book, in the same order as they stand there; but expressed in a technical style, that it may be transferred to the ledger with more ease.

When we are to enter any article in the journal, we must consider which accounts in the ledger it will require to be placed to, both on the Dr. and Cr. and write [*the former account*] Dr. to [*the latter account*]; then we annex an explanation of the article, and place the sum in the money-column.

EXAMPLE.

Waste-book) Sold for ready money, 30 yards linen, at 3 s L 4 10 —
Journal.) Cash Dr. to Linen. Sold 30 yards, at 3 s L 4 10 —

Here we consider, that the article must be entered on the Dr. of cash, because money is received; and on the Cr. of linen, because linen is delivered: Therefore we write *Cash Dr. to Linen*, to which we annex the nature of the transaction. The article thus entered is called a *journal post*; *Cash* is called the *Dr.*; *Linen* the *Cr.*; the words "*Cash Dr. to Linen*," the *Entry*, and the following words the *Narration*.

The purpose of expressing the article in this form,

is to point out the accounts in the ledger, to which it will require to be posted, and thereby enable the accountant to write the ledger with more ease than he could do if it were filled up immediately from the waste-book.

The learner will be able, from this example, to enter any simple article in the journal, providing he knows the accounts to which it should be posted on the Dr. and Cr. of the ledger. This must be collected from the description of the ledger accounts already given § 6—13. and the nature and tendency of the article.

16. GENERAL RULES for the JOURNAL-ENTRIES.

I. *Every thing received, or person accountable to us, is Dr.*

II. *Every thing delivered, or person to whom we are accountable, is Cr.*

17. As the whole art of writing the journal depends on a proper choice of the Drs. and Crs. we shall give some particular rules for the most common cases, and a few examples for the illustration and practice of each.

Rule I. *The person to whom any thing is delivered is Dr. to the thing delivered, when nothing is received in return.*

Therefore when money is paid, the receiver is Dr. to cash.

When goods or other property is sold on credit, the purchaser is Dr. to the thing sold. Thus,

Waste-book.) Paid John Bell in full	L 52 — —
Journal.) <i>John Bell Dr. to Cash</i> , paid him in full	52 — —
Waste-book.) Sold 50 yards cloth to J. Hill, at 12s	30 — —
Journal.) <i>J. Hill Dr. to Cloth</i> , sold him 50 yards, at 12s	30 — —

18. Rule II. *A thing received is Dr. to the person from whom it is received, when nothing is delivered in return.*

Therefore, when money is received, Cash is Dr. to the payer: when goods are bought, the goods are Dr. to the seller. Thus,

Waste-book.) Received from Thomas Gay in full	L 72 — —
Journal.) <i>Cash Dr. to Thomas Gay</i> , received in full	72 — —
Waste-book.) Bought from J. Hawley 60 lb. wool, at 9d	2 5 —
Journal.) <i>Wool Dr. to J. Hawley</i> , bought 60 lb. at 9d	2 5 —

19. Rule III. *A thing received is Dr. to the thing given for it.*

Therefore goods bought for ready money are Dr. to cash.

When goods are sold for ready money, Cash is Dr. to the goods.

When goods are bartered, the goods received are Dr. to the goods delivered. Thus,

Waste-book.) Bought for ready money 10 hds. wine, at L15	L 150 — —
Journal.) <i>Wine Dr. to Cash</i> , bought 10 hds. at L15	150 — —

Waste-book.) Sold for ready money 100 gallons rum, at 9s.	45 — —
Journal.) <i>Cash Dr. to Rum</i> , sold 100 gallons, at 9s	45 — —
Waste-book.) Bartered 3 hds. wine, at L.15, for 100 gallons rum, at 9s	45 — —
Journal.) <i>Rum Dr. to Wine</i> , received 100 gallons at 9s in barter for 3 hds. at L.15	45 — —

20. Rule IV. *Goods and other real accounts are Dr. for all charges laid out on them. If money be laid out, they are Dr. to Cash; if any thing else be delivered, they are Dr. to the thing delivered; if the charge be taken in trust, they are Dr. to the person to whom it is due.* Thus,

Waste-book.) Paid for repairs to ship Traffick	L 18 — —
Journal.) <i>Ship Traffick Dr. to Cash</i> , paid for repairs	18 — —
Waste-book.) Delivered wood from my timber-yard for repairing the Angel-tavern	15 — —
Journal.) <i>Angel-tavern Dr. to Wood</i> , delivered for repairing the same	15 — —
Waste-book.) Due to William Carpenter for repairs to the Angel-tavern	12 — —
Journal.) <i>Angel-tavern Dr. to William Carpenter</i> , due him for repairs	12 — —

21. Rule V. *When rents of houses or lands, freights of ships, bounties on goods, or any other profits from real accounts, are received, Cash is Dr. to the account from which the profit arises: if any thing besides money be received, the article received is Dr.: if they remain unpaid, the person who owes them is Dr.* Thus,

Waste-book.) Received freight of the ship Traffick for a voyage to London	L 35 — —
Journal.) <i>Ship Traffick Dr. to Cash</i> , received freight to London	35 — —
Waste-book.) Received 100 barrels salmon, being the rent of Inver fishery, at 52s	260 — —
Journal.) <i>Salmon Dr. to Inver fishery</i> , received the rent, being 100 barrels, at 52s	260 — —
Waste-book.) John Public owes me a year's rent of the Angel-tavern	52 — —
Journal.) <i>John Public Dr. to Angel-tavern</i> , for a year's due by him	52 — —

22. Rule VI. *When an article of loss occurs, Profit and Loss, or some subsidiary account, is Dr. If the loss be paid in ready money, it is Dr. to Cash; if it be paid in any thing else, it is Dr. to the thing delivered. If it remain unpaid, it is Dr. to the person to whom it is owing.* Thus,

Waste-book.) Given my daughter at her marriage	L 500 — —
Journal.) <i>Profit and Loss Dr. to Cash</i> , given my daughter at her marriage	500 — —
Waste-book.) Taken for family use from my granary 3 bolls meal, at 13s 4d	2 — —

Journal.)

Journal.) *Profit and Loss* [or *Proper expenses*] *Dr. to Meal*, taken for family use, 3 bolls, at 13s 4d 2 — —
Waste-book.) Due James Rich for a year's interest on L1000, at 4 per cent. 40 — —
Journal.) *Profit and Loss* [or *Interest account*] *Dr. to James Rich*, due him a year's interest on L1000 at 4 per cent. 40 — —

23. Rule VII. *When an article of gain occurs, that is not immediately connected with any real account, Cash, the article received, or the person accountable for it, is Dr. to Profit and Loss, or to some subsidiary account.*

Thus,

Waste-book.) Received in a gift from my father L100 — —
Journal.) *Cash Dr. to Profit and Loss*, received from my father 100 — —
Waste-book.) Received in like manner at opening shop, 100 yards cloth at 12s 60 — —
Journal.) *Cloth Dr. to Profit and Loss*, received from my father at opening shop 100 yards, at 12s 60 — —
Waste-book.) James Barbour owes me a year's interest of L1000 50 — —
Journal.) *James Barbour Dr. to Profit and Loss* [or *Interest account*] due by him for a year's interest of L1000 50 — —

24. Rule VIII. *When one person pays money, or delivers any thing else to another on our account, the person who receives it is Dr. to the person who pays it. Thus,*

Waste-book.) James Goldsmith has paid the bank of Scotland on my account, L100 — —
Journal.) *Bank of Scotland Dr. to James Goldsmith*, paid them by him 100 — —
Waste-book.) Arthur Young has delivered James Baker 100 quarters wheat, for which I am to account to him, at 30s 150 — —
Journal.) *James Baker Dr. to Arthur Young*, for 100 quarters wheat delivered him on my account, at 30s 150 — —
Payments of this kind are often transacted by bills of exchange.

25. These examples will make the learner acquainted with the form of the journal, and the rules extend to the greatest part of the simple transactions that occur in domestic trade. We may observe, that the technical sense of the words *Dr.* and *Cr.* has an analogy to their meaning in common language, but is not precisely the same. Thus, in *Ex. 1.* Rule VIII. the journal-entry is, *Bank of Scotland Dr. to James Goldsmith*; by which we are not to understand that the bank is indebted to James Goldsmith; for a debt between them has no connection with our business; and therefore ought not to be entered in our books: the meaning of the entry is, that the bank becomes indebted to us by the transactions narrated; and that we become indebted to James Goldsmith by the same.

26. An article which contains more Drs. or more Crs. than one, is called a *complex post*. The form of these will appear from the following examples.

Ex. 1. Sold William Drapier,
25 pieces cloth, at L15 — —
per piece L375 — —
130 stones wool, at 5s 6d — —
per stone 35 15 — —
— — — — — L410 15 — —

If the two articles sold to William Drapier were entered separately in the waste-book, and transferred to the journal by Rule I. they would stand thus:

William Drapier Dr. to Cloth, sold him 25 pieces, at L15 — — L375 — —
William Drapier Dr. to Wool, sold him 130 stones, at 5s 6d — — 35 15 — —

And if these were posted to the ledger, there would be two articles placed to the *Dr.* of William Drapier, one to the *Cr.* of Cloth, and one to the *Cr.* of Wool.

But the sales may be entered in the form of one complex journal post, as follows:

William Drapier Dr. to Sundries,
To Cloth, for 25 pieces, at L15 — — L375 — —
To Wool, for 130 stones, at 5s and 6d — — 35 15 — —
— — — — — L410 15 — —

And then there is only one article on the *Dr.* of William Drapier in the ledger.

Ex. 2. Sold 10 pieces cloth to W. Drapier, at L15 L150 — —
12 ditto to J. Mercer, at do 180 — —
— — — — — L330 — —
22

This example also falls under Rule I. But whereas there was one *Dr.* and two *Crs.* in the former example, there are two *Drs.* and one *Cr.* in this: William Drapier and John Mercer, the purchasers, are *Drs.* for their respective quantities; and cloth, which is the only thing delivered, is *Cr.* for the whole quantity. The journal post is,

Sundries Drs. to Cloth,
W. Drapier, for 10 pieces, at 15l. — — L150 — —
J. Mercer, for 12 ditto at 15l. — — 180 — —
— — — — — L330 — —
22

Ex. 3. Bought from H. Hood,
5 puncheons rum, at L42, L210 — —
3 hds. claret, at 33, 99 — —
2 pipes madeira, at 56, 112 — —
— — — — — L421 — —

This example falls under Rule II. The articles received, rum, claret, and madeira, are *Drs.*; and the person from whom they are received is the only *Cr.*

Sundries Dr. to Henry Hood,
Rum, for 5 puncheons, at 42l. L210 — —
Claret, for 3 hds, at 33, 99 — —
Madeira, for 2 pipes, at 56, 112 — —
— — — — — L421 — —

Ex. 4. Bt. 50 qrs. wheat from J. Tull, at 35s L87 10 — —
12 from S. Ellis, 36s 2 12 — —
— — — — — L109 2 — —
62

JOURNAL. Sundries to Dr. Sundries.
Lintseed, for 10 hds at 50s L 25 — —
Linen, for 500 yds, at 1s 6d 37 10 — —
 Received in barter from J. Fortheringal
Cash, for balance 15 — —
 L 77 10 — —

To Osnaburgs, for 100 pieces,
 at 12s L 60 — —
To Thread, for 100lb at 3s 6d 17 10 — —
 Delivered him in barter L 77 10 — —
 Or rather,
Sundries Dr. to James Fortheringal.
Lintseed, for 10 hds at 50s L 25 — —
Linen, for 500 yds, at 1s 6d 37 10 — —
 Received in barter
Cash, received balance 15 — —
 L 77 10 — —

James Fortheringal Dr. to Sundries.
To Osnaburgs, for 100 pieces,
 at 12s L 60 — —
To Thread, for 100lb at 3s 6d 17 10 — —
 Delivered in barter L 77 10 — —

29. It is neither practicable nor necessary to enumerate all kinds of complex posts that may occur in business. We shall here only mention the entries which occur at opening the books.

The first journal-post contains the substance of the inventory. The entry is *Sundries Drs. to Stock*; the particular Drs. are Cash, the different kinds of goods and other property belonging to us, and the persons indebted to us.

The second journal-post contains the debts due by us. The entry is, *Stock Dr. to Sundries*; the particular Crs. are the persons to whom we are indebted.

The form of these entries is more fully exhibited at the beginning of the following sets.

30. The journal should be written by one person, in a fair hand and at leisure hours. The articles are separated, and the titles and dates marked in the same manner as in the waste-book, § 3. The entries are written in half text, for ornament and distinction. In the inventory, the designation (or the business, station, and place of residence) of every person is mentioned; and the same is done the first time that any name occurs in journal-entry. At other times it is sufficient to enter the name without the designation, unless we have dealings with two persons of the same name; in which case, it is always necessary to annex the designation, in order to distinguish them. The narration should be complete, without referring to the waste-book; and so clear, that every person, acquainted with the style of the journal, may understand it with ease. When the post is written, we mark a dash / against the article, on the margin of the waste-book, to show how far the writing of the journal is advanced.

SECT. IV. Of POSTING and BALANCING the LEGER.

31. THE first thing to be done in the ledger, is to allot a proper space of each account. The accounts may be either opened in the same order that they oc-

cur in the journal; or accounts of the same kind may be placed together, the personal accounts on one part of the ledger, and the real accounts in another. The accounts of Stock, and Profit and Loss, are generally placed at the beginning. The room which each will require cannot be exactly known, but must be conjectured from the number of transactions that are likely to follow.

The number of the folio is marked in strong text at each corner of the top-line; and the titles of the accounts are written in fair text through both folios, if necessary. The designations of the personal accounts may be written on half text, or Italian hand; and some write the titles in Saxon hand for ornament. The word *Dr.* is prefixed to the title on the left-hand page; and *Contra Cr.* annexed to it on the right-hand page.

32. Next, An Index must be provided, for pointing out the folios where the accounts are opened. The titles of the accounts are entered alphabetically in the index, and the number of the folio annexed. Personal accounts are entered by the first letter of the surname; companies, by the first letter of the surname of the first partner; and all other accounts, by the first letter of the first word. The most convenient kind of index is a long narrow book, of 24 leaves, one for each letter of the alphabet. A is marked on the top of the first leaf, and the paper pared away below it; B is marked on the second leaf, under A; and the other letters on the following leaves, in the same manner; by means of which we can turn at once to any letter required.

33. In posting the ledger, proceed by the following directions. First, look for the Dr. of the journal-post in the index, under the proper letter, and this directs you to the folio of the ledger where the account is, if it be already opened: if not, you must allot a space for it, write the title, and enter it in the index. Then enter the article on the left-hand page of the account under the title of the former article, by writing the date on the margin, and the name of the creditor on the line, with the word *To* prefixed, and a short narration of the transaction annexed, and inserting the sum in the money column, and the quantity, if it be an account of goods, in the inner column. Then turn to the account of the Cr. of the journal-post, and enter the article in the right-hand page, prefixing the word *By* to the name of the Dr.

34. This being done, turn to the journal, and mark on the margin the number of the folios to which the article is posted. The figures which point out the reference to the Dr. and Cr. folios should be separated by a line: for example, If the Dr. entry be on the third folio, and the Cr. entry on the fifth, the reference is marked $\frac{3}{5}$. These figures show how far the posting is advanced, and are useful in comparing the books.

The figures for dates or references should be written in a lighter hand than the figures in the columns for money or quantity.

25. There is often a reference-column ruled in the ledger, for pointing out the other entry, corresponding to any article. In this column, the folio of the Cr. entry is marked against the Dr. article, and the folio of the Dr. entry against the Cr. article.

Sometimes

Sometimes the accounts are numbered according to their order in the ledger; and the references, both in the journal and ledger, point out the number of the account instead of the folio.

36. In complex posts, turn to the several Drs. or Crs. in their order, and enter the articles according to the foregoing directions; placing the sums belonging to each in the money-column against the respective entries.

37. An article in the ledger is generally comprehended in one line. The narration should be as full as can be contained in that bounds. If it cannot be narrated completely, the journal is referred to for further particulars, by writing *per Journal*, (or *p. J.*), either after an incomplete narration, or immediately after the Dr. or Cr. when there is no room for a proper narration. In complex posts, there can seldom be any narration annexed to the single Dr. or the single Cr. The entry is generally *To Sundries per J.* or, *By Sundries per J.* If the sense of the whole article can be narrated, it should be done; but it is improper to narrate the first or any other part of the article, and omit the others.

38. When the space allotted for an account in the ledger is filled up, the account must be transported to another folio. For this purpose add the columns on both sides, and write against the sum, *Transported to folio*, inserting the number of the folio where the new account is opened, in the reference-column, or on the line, if no reference-column be used. Then, after titling the new account, and entering the number of the folio in the index, write on the Dr. *To amount, brought from folio*, inserting the number of the folio where the old account was; and on the Cr. *By amount, brought from folio*; and place the sums and quantities, if any, in the proper columns.

When either side of an account is full, both sides should be transported, and diagonal lines drawn, to fill up the vacant space of the side which requires it.

39. The books should be written up as frequently as can be done conveniently; so that the journal may keep pace nearly with the waste-book, and the ledger with the journal. Each book should be carefully revised, and compared with the book from which it is posted. In comparing the ledger, observe the following directions:

Begin with the first journal-post, and turn to the folio of the ledger where the Dr. is entered, which you are directed to by the marginal reference, and compare the date, entry, and sum. If you find them to correspond, it is well; if not, the ledger must be altered till it correspond with the journal. Then place a dot before the reference-figure in the journal, and a mark Δ before the sum in the ledger.

Proceed in the same manner to compare the Cr. of the journal-post, and all the following posts in their order. The dots in the journal show how far the comparison is advanced, and the marks in the ledger show what articles are compared.

The sums of accounts transported should be left blank till the books be compared; as an error in any article will occasion an alteration in the sum.

40. Some accountants correct all errors in the ledger, without erasing any thing, by the following methods: 1st, If the sum be entered too small, they make

a second entry for the deficiency. 2d, If it be entered too large, they make an entry on the opposite side for the excess. 3d, If it be entered on the wrong side of the account, they enter it twice on the other; once, to counterbalance the error, and a second time for the true entry. 4th, If it be entered on a wrong account, they charge the wrong account Dr. to, or Cr. by, the right one.

41. We do not much approve of these methods, as they give the books a confused appearance; and would rather recommend the following rules: 1st, If an article be omitted, do not attempt to interline at the place where it should have been; but insert it under the last article when you discover the omission, and mark a cross $\times$ against it on the margin, and another at the place where it should have been. 2d, If you discover a mistake immediately when committed, correct it without cancelling any thing, as in this example. *To Cash, say, To James Speirs received to account.* 3d, If you have written a line entirely wrong, or in a wrong place, write the word *Error* at the end, prefix a cross, and omit or cancel the sum. 4th, Cancel errors, by drawing a line lightly through them, so that the old writing may still be legible; by which it will be evident, that the book has not been vitiated for a fraudulent purpose. The same method should be followed in correcting errors in the journal.

42. When the comparison of the books is finished, glance over the ledger, to observe if the mark of comparison be affixed to every article. If not, you must turn to the journal, and observe if the articles be right which had been marked.

43. Because the whole sum of the Dr. side of the ledger should be equal to the whole sum of the Cr. § 14. it is proper to try if they correspond. For this purpose, you may add the Dr. of every account, except such as are already balanced, placing the sums in an inner column, and extending them at the end of one or more folios, as you find most convenient, to the outer column; and as you go along, add the Cr. in the same manner. If the sum total of both sides be equal, it gives a presumption that the books are right; if they differ, there is certainly some mistake. This is called the *Trial-balance*. The labour bestowed upon it is not lost, as the sums may be reserved for assisting us to collect the balances; the method of which will be explained afterwards.

44. If the sums of the trial-balance do not correspond, the books must be examined again. For this purpose, begin with the first article on the Dr. side of the first account, and turn to the account where the corresponding entry is, which you will find by the figure in the reference-column. If the articles agree, mark them with a dot. Proceed in like manner with the other articles on the Dr. of the first account; then with the articles on the Cr. of the same; and then with the following accounts in their order, till the error or errors be discovered. In complex entries, observe if the amount of the sums on one side be equal to the sum on the other. When you come to a dotted article, you may pass it by, because it has been examined already.

If the errors be not discovered at the first revival, you must repeat the same operation again, till you bring the books to balance. Marks different from the former ones,

ones, or differently placed, may be used, to signify that an article has been examined a second or third time. As the detection of errors is the most tedious and disagreeable part of book-keeping, the accountant will be induced to guard against them with all possible care, when he has once experienced the trouble which they occasion.

45. Before we explain the method of balancing the books, it will be proper to direct the learner how to balance particular accounts. When we settle accounts with any person, and ascertain how much is owing at either hand, it is necessary to balance his account in the ledger, and open a new one, beginning with the sum that was due according to the settlement; and when we clear accounts again, we must go back to that article, and no farther.

If any articles be charged on either side, at the time of settling, they must be immediately entered on the waste-book; from which they will pass in course to the journal and ledger; and a remark must be entered in the waste-book, that the account was settled, and the balance transferred to the proper side of the new account. This remark is transcribed in the journal; and the ledger account is balanced, when it occurs, in the course of posting.

If the balance be due to you, write on the Cr. *By balance due to him to Dr. new account*, and insert the sum due you; after which, the amount of both sides will be equal. Add the account, placing the sums opposite to each other; and, if the sides be unequal, draw a diagonal line through the vacant space of the shorter side, and close the old account by drawing lines under the sums. Then open the new account immediately under the old one, or in a new folio, if the old one be full, by writing on the Dr. *To balance of former account due by him*. If the balance be due by you to him, the entries are made on the opposite sides, with the necessary alterations. When the new account is opened in the same folio, it is unnecessary to repeat the title; but the year and month, as well as the day, are repeated at the date of the first article.

46. Sometimes when an account is balanced, one or more articles are left out on purpose: For example, goods lately bought on credit may be left out, and the settlement may only relate to articles of longer standing. When this is the case, if the articles omitted be on the Dr. of the ledger, we write on the Cr. thus, *By articles sold him since 1st January replaced*: and when we have balanced the account, and opened a new one, we write on the Dr. *To articles replaced at settling, furnished since 1st January*: or, if the articles were left out for any other reason, we explain the same in the narration. If the omitted articles be on the Cr. the like entries are made on the opposite sides. It should be noticed in the waste-book and journal when this operation is necessary.

47. When we post any common article from the journal, we enter the sum on the Dr. of one account, and on the Cr. of another: when we balance an account, we place the balance sum on the Dr. of the old account, and on the Cr. of the new one, or contrarywise: and when we replace an article, as above directed, to the Dr. or Cr. of the old account, we place it after balancing to the Cr. or Dr. of the new one. Thus, in these entries, as well as in common posts, there are like

sums entered on the Dr. and Cr. of the ledger, and the general equality of the sides is still preserved.

48. Merchants generally balance their books once a year. The design of this operation is, to collect the various branches of their business, diffused through the books, into a concise abstract; to ascertain their gain or loss since the last balance; and exhibit the present state of their funds. If the business be of such a kind, that most of the branches naturally come to an issue at a certain time of year, that time is the proper one for making the balance. Otherwise the end of the year, or the least busy time, may be chosen.

49. It is proper, before balancing, to settle as many personal accounts as possible; to clear all arrears and small charges; to take an exact inventory of the goods on hand, as far as can be done; and affix a moderate value to each article, according to the current prices at the time; such a value as you would be willing at present to buy for. It is more proper to value the goods on hand in conformity to the current prices, than at prime cost: for the design of affixing any value is to point out the gain or loss, and the gain is in reality obtained so soon as the prices rise, or the loss suffered so soon as they fall; therefore it is impossible to make up a just state of the affairs, unless the present prices be attended to.

50. These things being done, proceed to make the balance as follows: Prepare two sheets of paper, ruled with money-columns, in the form of Dr. and Cr.; write *Profit and Loss* as the title of the first, and *Balance* as the title of the second.

Prepare also some paper for computing the balances, and mark down the folios, titles, and sums of each account in the ledger, in a regular order. If a trial-balance was made, the sums may be transcribed from it. Pass by such accounts as are already closed; also the accounts of Stock and Profit and Loss, which are always the last of being balanced. Then subtract the lesser sum from the greater, and enter the difference on either of the sheets that the nature of the article points out, and on the side of that sheet which corresponds to the greater sum of the account. More particularly,

In personal accounts, enter the difference, which is the debt owing to you, or by you, on the proper side of the balance-sheet.

In the cash-account, enter the difference, which is the money in hand, on the Dr. side of the balance-sheet.

In accounts of goods or other property, if there be nothing remaining on hand, enter the difference, which is the gain or loss, on the proper side of the profit and loss sheet.

If the whole be still on hand, enter the present value on the Dr. of the balance-sheet; and, if this be different from the prime cost, charges included, enter the difference in the proper side of the profit and loss sheet.

If part be sold, and part on hand, place the value of the quantity on hand under the sum of the Cr. and add them. The sum is the whole return that will be obtained, if the rest of the goods be sold at the estimated value; and this, being compared with the sum of the Dr. which is the whole expence, shows the gain or loss. Enter the same in the proper side of the profit and loss sheet, and enter the quantity and value on hand on the Dr. of the balance-sheet.

Observe if the quantities in the inner columns be equal.

qual on both sides, when the goods are all sold; or, if the difference, when only part is sold, be equal to the quantity on hand. If they correspond, you have a just account of the goods. If the Dr. be greater, there is something amiss, which you must enter on the Dr. of the balance-sheet, and mark the cause of the deficiency, as intake, waste, or the like. If the Cr. be greater, there is an excess, which you must enter on the Cr. of the balance-sheet, together with the occasion of it, as difference of measure, or the like.

In accounts subsidiary to profit and loss, enter the difference on the proper side of the profit and loss sheet.

When there is nothing written on one side of an account, enter the sum of the article or articles on that sheet which the kind of the account points out.

51. When you have collected all the balances, sum up both sheets, and add to the profit and loss sheet the sums of the profit and loss account in the ledger: then subtract the lesser sum of each sheet from the greater.

This being done, mark the sums of the stock-account on your computation paper, and add thereto the balance of the profit and loss sheet on the side which corresponds with the greater sum of that account: then subtract the lesser sum from the greater. The remainder will be equal to the difference of the sides of the balance-sheet, if the books be right, and the balances exactly collected.

52. We shall prove that this equality must always hold, from the nature of the articles collected. The Dr. of the balance-sheet contains every kind of property belonging to you, and every debt owing to you; and the Cr. contains every debt owing by you: therefore the difference of the sides shows what your nett estate amounts to. The profit and loss sheets, when the articles from the ledger are included, contains every thing you have gained on the Cr. and every thing you have lost on the Dr.; and the difference of the sides is your nett gain or loss. The stock-account contained your effects and debts at the time the books were opened; and therefore, when the gain or loss is added to the proper side, it must show the extent of your nett estate at present. Thus the stock-account and the balance-sheet both point out how much you are worth at present; the one from your former stock, allowance being made for your gains or losses; the other from a view of your present effects and debts; and they will correspond, because both must be agreeable to the truth, if the books be correct.

53. Though the books must balance, if free from error, yet it is sometimes difficult to adjust them exactly, especially when the business is extensive, and the errors trifling. If there be still a difference, which we do not think it worth while to make further search for, we may close the books, by making Profit and Loss Dr. or Cr. for the same. This introduces an article on one side of the ledger, which has none corresponding to it on the other, but is balanced by some undiscovered error.

54. The balance being struck, your next work is to close the books. Every article in the ledger should be posted from the journal; therefore, the most regular way of finishing both is by inserting the following articles in the journal, and posting them in the common manner to the ledger.

1st, *Profit and Loss Dr. to Sundries, for loss, on the*

following accounts. The particulars are taken from the Dr. of the Profit and Loss sheet.

2d, *Sundries Dr. to Profit and loss, for gain, on the following accounts.* The particulars are taken from the Cr. of the Profit and Loss sheet.

3d, *Balance-account Dr. to Sundries, for debts and property belonging to me.*

4th, *Sundries Dr. to balance-account, for debts due by me.* The particulars of this and the former are taken from the respective sides of the balance-sheet.

5th, *Profit and Loss Dr. to Stock for nett gain; or Stock Dr. to Profit and loss, for nett loss.*

6th, *Balance-account Dr. to Stock for nett stock.*

55. When the four first of these articles are posted in the ledger, all the personal, real, and subsidiary accounts will balance, and you may add them as you go along. In accounts of goods, if there be any deficiency, you must enter it on the Cr. in the inner column; and, if there be any outcome, you must enter it on the Dr. before you add the account. Then the sums of every account and every column on the opposite sides will be equal.

The only accounts that remain open are, *Profit and Loss, Stock, and Balance.* The fifth post balances the profit and loss account, and the sixth balances the stock-account. It was noticed, § 14, that the whole sums of Dr. and Cr. of the ledger are equal; and therefore, if the sides of every account, except one, be balanced, that one will balance of its own accord. The balance-account alone remains open, and, upon trial, you will find that the sides are equal. This affords an additional proof, or, at least, a different view, of what was demonstrated, with respect to the balance of the books, in § 52.

The lines above and under the sums, at a general balance, may be drawn with red ink; and, at the balancing of particular accounts, with black ink, for distinction.

56. Some chuse to insert the particulars of the profit and loss and balance sheets in the respective accounts of the ledger. If this be done, it is unnecessary to enumerate them also in the journal.—Some chuse to balance the accounts of goods, whenever the quantity is sold off; and we approve of this method, as it lessens the work at the general balance, which is always sufficiently laborious.

57. Thus is the state of a person's affairs brought together, in a short compass, under his view; and the articles of the balance-sheet supply materials for a new inventory. It is convenient, however, to alter the order, and arrange the real accounts together, and the personal ones together.

58. It is not necessary to begin new books, nor open the accounts anew, unless the old folios be full. The accounts may be continued in the former folios; but it is best to begin a new ledger, if the old one be not likely to hold all the business of the next year. When one comes to have several sets of books, it is common to distinguish them by the letters of the alphabet. The first waste-book, journal, and ledger, are marked A, the second, B; and so on.

In the following specimen, the waste-book and journal are placed on opposite pages, that the learner may easily compare them; and the rules are referred to by their numbers.

WASTE-

(1) WASTE-BOOK,
Edinburgh, JANUARY 1. 1789.INVENTORY of ready money, goods, and debts,
belonging to James Oswald merchant in Edinburgh.

Ready money - - - L 75 10 -
 200 bolls meal, at 13 s L 130 - -
 6 hds Port wine, at L 15 90 - -
 70 reams paper, at 10 s 6d 36 15 -
 120 sp. five hank yarn, at
 2 s 3 d - - - 13 10 -

270 5 -
 A house in Lawn-market Edin. value 300 - -

James Boswell merch. Edin.

owes per account L 73 4 -

Thomas Pirie writer Edin.

owes per do 12 3 8

Henry Hardy merch. Glas-

gow per bill 75 - -

David Miller manufacturer

Haddington, per receipt 18 - -

§ 29

178 7 8

824 2 8

LIST of debts by the said James Oswald.

To the Royal bank per account L 230 - -

To Tho. Smith merchant London per do 54 - -

To Will. Nisbet carpenter Leith per do 28 7 3

§ 29

312 7 3

Bought for ready money 105 yards calicoe, at 3 s 2d
Rule III.Sold James Cuthbert merchant Leith 50 bolls meal,
at 13 s 3d - -

Rule I.

Bartered 60 spindles five hank yarn, at 2 s 4d, for 80
yards diaper, at 1 s 9d - -

Rule III.

Paid William Nisbet in full - - -

Rule I.

Bought from Will. Bruce merchant
Leith, 200 bushels salt, at 1 s 8d L 16 13 4

320 stone iron, at 3 s 4d 53 6 8

Rule II.

Sold 30 rms paper to Ja. Boswell, at 12 s L 18 - -

12 to John Henderson stationer

Edinburgh, at 12 s 7 4 -

5 for ready money, at 11 s 2 15 -

47

Rules I. III.

27 19 -

Sold Will. Hunter merchant Dunbar

150 bush. salt, at 1 s 9d. L 13 2 6

Received in part - -

L 10 - -

And he owes the balance - -

3 2 6

Rules I. III.

13 2 6

VOL. III. Part I.

JOURNAL.
Edinburgh, JANUARY 1. 1789.Sundries Dr. to Stock for articles belonging to James
Oswald merchant Edinburgh.

.1 Cash on hand - - - L 75 10 -

.1 Meal. For 200 bolls at 13 s L 130 - -

.1 Port-wine. For 6 hds at L 15 90 - -

.2 Paper. For 70 rms, at 10 s 6d 36 15 -

.2 Yarn. For 120 sp. five hank,
at 2 s 3 d - - - 13 10 -

270 5 -

.2 House in Lawn-market Edin. value 300 - -

.2 Ja. Boswell mer. Ed. per ac. L 73 4 -

.2 Tho. Pirie writer Ed. per do 12 3 8

.2 Henry Hardie merchant Glas-

gow per bill - - - 75 - -

.2 David Miller manufacturer

Haddington, per receipt 18 - -

178 7 8

824 2 8

.1 Stock Dr. to Sundries.

.2 To Royal Bank per account L 230 - -

.3 To Tho. Smith merch. London per acc. 54 - -

.3 To Will. Nisbet carpenter Leith per do 28 7 5

312 7 3

.3 Calicoe Dr. to Cash. Bought 105 yards at 3 s 2d 16 12 6

.3 James Cuthbert merchant Leith, Dr. to Meal, sold
50 bolls, at 13 s 3d - -

33 2 6

.3 Diaper Dr. to Yarn. Delivered 60 sp. five hank in
barter for 80 yards, at 1 s 9d - -

7 - -

.3 William Nisbet Dr. to Cash. Paid him in full 28 7 3

28 7 3

Sundries Drs. to William Bruce merchant Leith.

.3 Salt. For 200 bushels, at 1 s 8d L 16 13 4

.3 Iron. For 320 stones, at 3 s 4d 53 6 8

70 - -

.15 Sundries Drs. to Paper.

.2 James Boswell, for 30 rms, at 12 s L 18 - -

.4 John Henderson stationer

Edinburgh, for 12 12 s 7 4 -

.1 Cash. For - - - 5 11 s 2 15 -

.2 - - - - -

27 19 -

Sundries Drs. to Salt, for 152 bsh. at 1 s 9d, L 13 2 6

.1 Cash. Received in part - - L 10 - -

.4 William Hunter merchant Dunbar, for

balance due by him - - 3 2 6

12 2 6

Edinburgh,

3 B

✓ Received from Henry Hardy in pay-
ment of his bill L75 — —
And for interest on do 2 10 —

Rules II. VII.

✓ Paid the Royal Bank — — 100 — —
Rule I.

Bought from Alex. Sharp merch. Dundee 500 sp
four hank yarn, at 1s 11d L47 18 4
Paid him in part — — L15 — —
And the balance due him is 32 18 4

Rules II. III.

✓ Received 150 bolls meal, at 13s 2d L98 : 15s, in bar-
ter for 6 hds. Port wine, at L16 L96 — —
Paid the balance — — 2 15 —

Rule III.

Edinburgh, 2d FEBRUARY 1789.

✓ Sold James Boswell
48 bush. salt, being the rem. at 1s 8½d L4 2 —
60 sp. five hank yarn, at 2s 3½d 6 17 6
100 stone iron, at 3s 4½d — 16 17 6

Rule I.

✓ Received from James Cuthbert in part — — 30 — —
Rule II.

✓ Bartered 22 reams paper, at 12s L13 4 —
30 bolls meal, at 13s 6d 20 5 —
L33 9 —

For 334½ sp. four hank yarn, at 2s — — 33 9 —
Rule III.

✓ Taken for the use of my shop the remaining ream
paper, value — — 10 6 —
Rule VI.

✓ Received from William Hunter in full L3 2 6
from James Boswell in part 70 — —

Rule II.

✓ Paid the Royal Bank — — 100 — —
Rule I.

✓ Bartered 100 yards calicoes, at 3s 6d L17 : 10s.
For one hd. Port-wine — — L14 10 —
Received the balance — — 3 — —

Rule III.

.1 Cash Dr. to Sundries.
.2 To Henry Hardy. Rec. paym. of his bill L75 — —
.1 To Profit and Loss. Rec. interest on do 2 10 —

.2 Royal Bank Dr. to Cash. Paid them — — 100 — —
.2

.2 Yarn Dr. to Sundries, for 500 spindles four hank,
at 1s 11d L47 18 4
.1 To Cash. Paid in part — — L15 — —
.4 To Alex. Sharp merch. Dundee for bal. 32 18 4

.1 Meal Dr. to Sund. for 150 bolls, at 13s 2d L98 : 15s

.1 To Port-wine. For 6 hds. delivered in
barter, L16 L96 — —
.1 To Cash. Paid balance — — 2 15 —

Edinburgh, 2d FEBRUARY 1789.

.2 James Boswell Dr. to Sundries.
.2 To Salt, for 48 bush. being the rem. — — L4 2 —
.3 at 1s 8½d — — 6 17 6
.2 To Yarn, for 60 sp. five hank, at 2s 3½d 6 17 6
.3 To Iron, for 100 stones, at 3s 4½d 16 17 6

.1 Cash Dr. to James Cuthbert. Received in part — — 30 — —
.3

.2 Yarn Dr. to Sundries. For 334½ sp. four hank yarn,
at 2s L33 : 9s
.2 To Paper. For 22 reams delivered in
barter, at 12s L13 4 —
.1 To Meal. For 30 bolls at 13s 6d 20 5 —

.4 Charges Merchandize Dr. to Paper, taken for the use
of shop, 1 ream, value — — 10 6 —
.2

.1 Cash Dr. to Sundries.
.1 To William Hunter. Received in full L3 2 6
.4 To James Boswell. — — in part 70 — —
.2

.2 Royal Bank Dr. to Cash. Paid them — — 100 — —
.1

.1 Sundries Drs. to Calicoes. For 100 yards delivered in
barter, at 3s 6d L17 : 10s
.1 Port-wine. For 1 hd. — — L14 10 —
.1 Cash. Received balance — — 3 — —
.3

Edinburgh

(3)

WASTE-BOOK.

Edinburgh, 19th FEBRUARY, 1789.

✓ Sold 30 bolls meal for ready money, at 13s 8d	L20 10 —			
45 to Henry Hardy, at 13s 10d	31 2 6			
27 to William Hunter, at 13s 10d	18 13 6			
52 to Baillie and Bell, Borrow- townness, at 13s 10d	35 19 4	106	5	4
154	Rules I. III.			
✓ Drawn on the Royal Bank		120		
Rule II.				
✓ Paid William Bruce in part	L50 — —			
Alexander Sharp in full	32 18 4			
And Tho. Smith's bill on me at fight	35 — —	117	18	4
Rule I.				
Edinburgh, 2d MARCH, 1789.				
✓ Paid charges and cellar-rent of falt	L1 2 6			
Charges and loft-rent of meal	3 3 —	4	5	6
Rule IV.				
✓ Received from Thomas Pirie in full	L12 — —			
Discounted him	— 3 8	12	3	8
Rule II. VI.				
✓ Sold James Dalton, Manchester				
60 spindles four hank yarn, at 28 $\frac{1}{4}$ d	L 6 1 3			
300 do do at 18 11 $\frac{1}{4}$ d	29 13 9	35	15	—
360	Rule I.			
✓ Received from Jan Jonkheer Rotterdam 6 bags clo- ver seed, qt. 200 lb. each, amount per invoice	L28 12 —			
f. 312, at 22d per f.				
Paid freight and charges	1 5 —	29	17	—
Rules II. IV.				
✓ Bartered with James Boswell 2 bags clover seed, at				
L6, L12, for 2 hds. lintf. at 55s	L 5 10 —			
Received in money	5 — —			
And he owes the balance	1 10 —	12		
Rules III. I.				
✓ Paid Tho. Smith in full	L19 — —			
And for interest	1 10 —	20	10	—
Rules I. IV.				
✓ Sold 140 lb. clover-feed to John Scott farmer at				
Haugh-head, at 7 $\frac{1}{2}$ d	L4 7 6			
70 to James Cuthbert, at 7 $\frac{1}{2}$ d	2 3 9			
120 for ready money, at 7 $\frac{1}{2}$ d	3 12 6	10	3	9
330	Rules I. II.			

JOURNAL.

Edinburgh, 19th FEBRUARY, 1789.

(3)

Sundries Drs. to Meal.				
1 Cash. For 30 bolls, at 13s 8d	L20 10 —			
2 Henry Hardy. For 45	13s 10d 31 2 6			
4 William Hunter. For 27	13s 10d 18 13 6			
4 Baillie and Bell, Bor- rowtownness. For 52	13s 10d 35 19 4	106	5	4
154				
✓ 1 Cash Dr. to Royal Bank. Drawn on them		120		
2				
Sundries Drs. to Cash.				
3 William Bruce. Paid him in part	L50 — —			
4 Alex. Sharp. Paid him in full	32 18 4			
3 Tho. Smith. Paid his bill on me at fight	35 — —	117	18	4
1				
Edinburgh, 2d MARCH, 1789.				
Sundries Drs. to Cash.				
3 Salt. Paid charges and cellar-rent	L1 2 6			
1 Meal. Paid charges and loft-rent	3 3 —	4	5	6
1				
Sundries Drs. to Thomas Pirie.				
1 Cash. Received in full	L12 — —			
1 Profit and Loss. Discounted him	— 3 8	12	3	8
2				
James Dalton, Manchester, Dr. to Yarn.				
4 For 60 sp. four hank, at 28 $\frac{1}{4}$ d	L 6 1 3			
2 And 300 do. at 18 11 $\frac{1}{4}$ d	29 13 9	35	15	—
360				
Clover-feed Dr. to Sundries.				
4 To Jan Jonkheer, for 6 bags, qt. 200 lb. each,				
4 is 1200 lb. amount per invoice, f. 312, at				
22d	L28 12 —			
1 To Cash. Paid freight and charges	1 5 —	29	17	—
17				
Sundries Drs. to Clover-feed. For 2 bags, at				
L6	L 12 — —			
4 Lint-feed, for 2 hds. recd. in bart. 55s	5 10 —			
1 Cash. In part	5 — —			
4 James Boswell, for balance	1 10 —	12		
Sundries Drs. to Cash.				
3 Thomas Smith. Paid him in full	L19 — —			
1 Profit and Loss. Paid him interest	1 10 —	20	10	—
1				
Sundries Drs. to Clover-feed.				
5 John Scott, farmer at Haugh-head, for				
140 lb. at 7 $\frac{1}{2}$ d	L 4 7 6			
3 James Cuthbert, for 70	7 $\frac{1}{2}$ d 2 3 9			
1 Cash for 120	7 $\frac{1}{2}$ d 3 12 6	10	3	9
4				
330				
3 B 2				
Edinburgh,				

(4) WASTE-BOOK.

Edinburgh, 24th MARCH, 1789.

✓ James Boswell has paid the Royal Bank on my acct
Rule VIII.

40

-25-

✓ Bought from William Ainslie merchant Alloa $\frac{1}{3}$ share
of the ship Hazard, for
Rule II.

150

-28-

✓ Sold Baillie and Bell,
150 stone Iron, at 3 s 7 d L. 26 17 6
1 hd. Port-wine 15 5 -

42 2 6

Rule I.

Edinburgh, 1d APRIL, 1789.

✓ Sold for ready money
50 yards diaper, at 18 11d L 4 15 10
30 bolls meal, at 13 s 7 d 20 7 6
1 hd. lint-feed 3 3 0
160 lb. clover-feed, at 7 $\frac{1}{2}$ d 5 3 4
30 stone iron, at 3 s 6 $\frac{1}{2}$ d 5 6 3

38 15 11

Rule III.

6.

✓ Drawn on the Royal Bank for
Rule II.

60

✓ Bought for ready money
30 casks train oil, at 22 s L 33 - -
30 bolls meal, at 13 s L 19 10 -
40 do. at 13 s 2d 26 6 8
70 45 16 8

78 16 8

Rule III.

✓ Sold Will. Ainslie 30 yds. diaper, at 2 s L 3 - -
And paid him 30 - -

33

Rule I.

-8-

✓ Baillie and Bell have paid Will. Ainslie, at my de-
fire, balance of my share of the ship Hazard
Rule VIII.

117

-11-

✓ Sold James Boswell 20 casks train-oil, at 27 s
Rule I.

27

-14-

✓ Sold George Gordon merch. Stirling
10 casks train oil, at 28 s L 14 - -
1 hd. lint-feed 3 5 -
35 bolls meal, at 13 s 8 d 23 18 4

L 41 3 4

Received in part L 35 - -
And he owes the balance 6 3 4

41 3 4

Rule I. II.

-16-

✓ Paid Baillie & Bell's bill on me to C. Cowan, at sight
Rule I.

38 18 2

JOURNAL.

Edinburgh, 24th MARCH, 1789.

.2 Royal Bank Dr. to James Boswell. Paid them by him 40

-25-

.5 Share of ship Hazard Dr. to William Ainslie mer-
chant Alloa, bought $\frac{1}{3}$ share for 150

-28-

.4 Baillie and Bell Drs. to Sundries.

.3 To Iron. For 150 stone, at 3 s 7 d L 26 17 6

.1 To Port-wine. For 1hd. 15 5 -

42 2 6

Edinburgh, 2d APRIL, 1789.

.1 Cash Dr. to Sundries.

.3 To Diaper. For 50 yards, at 18 11d L 4 15 10

.1 To Meal. For 30 bolls, at 13 s 7 d 20 7 6

.4 To Lint-feed. For 1hd. 3 3 -

.4 To Clover seed. For 160 lb. at 7 $\frac{1}{2}$ d 5 3 4.3 To Iron. For 30 stone, at 3 s 6 $\frac{1}{2}$ d 5 6 3

38 15 11

6.

.1 Cash Dr. to Royal Bank. Drawn on them for 60

-6-

Sundries Drs. to Cash.

.5 Train oil. For 30 casks, at 22 s L 33 - -

.1 Meal. For 30 bolls, at 13 s L 19 10 -

.1 And 40 at 13 s 2d 26 6 8

70 45 16 8

78 16 8

.5 William Ainslie Dr. to Sundries.

.3 To Diaper. For 30 yards, at 2 s L 3 - -

.1 To Cash. Paid him 30 - -

33

-8-

.5 William Ainslie Dr. to Baillie and Bell. Paid him
by them on my account, being balance of share
of ship Hazard 117

-11-

.2 James Boswell Dr. to Train oil Sold him 20 Casks
at 27 s 27

-14-

.5 George Gordon Dr. to Sundries.

.5 To Train-oil For 10 casks, at 28 s L 14 - -

.4 To Lint-feed For 1hd. 3 5 -

.1 To Meal. For 35 bolls, at 13 s 8 d 23 18 4

41 3 4

.1 Cash Dr. to George Gordon. Received in part 35

-5-

.4 Baillie and Bell Dr. to Cash. Paid their bill on me
to C. Cowan, at sight 38 18 2

-16-

Edinburgh

(5)

WASTE-BOOK.

Edinburgh, 18th APRIL, 1789.

✓ Taken for the use of my family, the remaining five yards calicoe, at 3s 2d
Rule VI.

15 10

✓ The Royal Bank have paid Jan Jonkheer's bill on me, 1 mdt. at my desire
Rule VIII.

28 12

✓ Received my proportion of profits on a voyage for Rotterdam by the Hazard
Rule V.

33

✓ Paid for small charges on my business since first January
Personal and family expences

L 5 3 8

32 — —

37 3 8

Rule VI.

✓ Due Thomas Sharp, my clerk, for wages
Rule VI.

8 — —

✓ Due to the Royal Bank for interest
Rule VI.

2 11 2

Previous to the balancing of my books, I have taken an inventory of the goods in my shop and ware-house,

124 bolls meal, at 13s 6d

L 83 14 —

474 sp. four hank yarn, at 2s

47 8 —

40 stone iron, at 3s 4d

6 13 4

300 lb. clover-seed, at 6d

7 10 —

L 145 5 4

I value my house at

300 — —

And my share of ship Hazard

140 — —

L 585 5 4

JOURNAL.

Edinburgh, 18th APRIL, 1789.

(5)

.5 Proper expences Dr. to Calicoes. For 5 yards taken for family use, at 3s 2d

15 10

.4 Jan Jonkheer Dr. to Royal Bank. For his bill on me 1 mdt. paid by them

28 12

.1 Cash Dr. to Share of Ship Hazard. Received my proportion of profits on a voyage to Rotterdam

33

Sundries Drs. to Cash.

.4 Charges Merchandize. Paid small charges since Jan. 1.

L 5 3 8

.5 Proper Exp. Paid perf. and family charges

32 — —

37 3 8

.4 Charges of Merchandize Dr. to Thomas Sharp, my clerk. Due him for wages

8 — —

.2 Profit and Loss Dr. to Royal Bank. Due them for int.

2 11 2

.1 Profit and Loss Dr. to Sundries, for articles of loss.

.3 To Salt — — — L — 11 4

.4 To Charges Merchandize — — — 13 14 2

.5 To Proper Expences — — — 32 15 10

See § 54.

47 1 4

Sundries Drs. to Profit and Loss, for articles of gain.

.1 Meal — — — L 9 18 —

.1 Port wine — — — 6 15 —

.2 Paper — — — 4 18 6

.2 Yarn — — — 2 3 2

.3 Calicoes — — — 1 13 4

.3 Diaper — — — 15 10 —

.3 Iron — — — 2 7 11

.4 Clover-seed — — — 5 — 1

.4 Lint-seed — — — 18 — —

.5 Share of ship Hazard — — — 23 — —

.5 Train oil — — — 8 — —

65 9 10

.5 Bal. Account Dr. to Sun. for articles belonging to me.

.1 To Cash — — — L 8 3 10

.1 To Meal. For 124 bolls, at 13s 6d

83 14 —

.2 To Yarn. For 474 sp. at 2s

47 0 —

Amiffing $\frac{1}{2}$ spindle.

.2 To House in Lawn-market — — — 300 — —

.2 To James Boswell — — — 37 11 —

.2 To Henry Hardy — — — 31 2 6

.2 To David Miller — — — 18 — —

.3 To James Cuthbert — — — 5 6 3

.3 To Iron. For 40 stone, at 3s 4d

6 13 4

.4 To John Henderson — — — 7 4 —

.4 To William Hunter — — — 18 13 6

.4 To James Dalton — — — 35 15 —

.4 To Clover-seed. For 300 lb. at 6d

7 10 —

Inlake 10 lb.

.5 To John Scott — — — 4 7 6

.5 To Share of ship Hazard — — — 140 — —

.5 To George Gordon — — — 6 3 4

757 12 3

(6) JOURNAL.

Edinburgh, 30th APRIL 1789.

<i>Sundries Drs. to Balance-account.</i>						
1	Meal.	Outcome 3 bolls				
2	Royal Bank	- - -	L 201	3	2	
3	William Bruce	- - -	20	-	-	
5	Thomas Sharp	- - -	8	-	-	
5						229 3 2
1	Profit and Loss	Dr. to Stock, for nett gain		16	13	8
1	Stock	Dr. to Balance-Account, for nett stock		528	9	1
5						
The next JOURNAL would begin thus.						
<i>Sundries Drs. to Stock.</i>						
	Cash on hand		L 8	3	10	
	Meal.	For 124 bolls, at 13s	L 83	14	-	
	Yarn.	For 474 sp. 4-hank, at 2s 47	8	-	-	
	Iron.	For 40 stone, at 3s 4d	6	13	4	
	Clover-feed.	For 300lb. at 6d	7	10	-	
						145 5 4
	House in Lawn-market Edin-					
	burgh, value	L 300	-	-		
	Share in ship Hazard. For					
	one third	140	-	-		
						440 - -
	James Boswell Edinburgh.					
	Due by him	L 37	11	-		
	Henry Hardy Glasgow. Do.	31	2	6		
	David Miller Haddington. Do.	18	-	-		
	James Cuthbert Leith. Do.	5	6	3		
	John Henderson Edin. Do.	7	4	-		
	William Hunter Dunbar. Do.	18	13	6		
	James Dalton Manchester. Do.	35	15	-		
	John Scott Haughhead. Do.	4	7	6		
	George Gordon Stirling. Do.	6	3	4		
						164 3 1
						757 12 3
<i>Stock Dr. to Sundries.</i>						
	To Royal Bank. Due them	L 201	3	2		
	To William Bruce, Leith. Due him	20	-	-		
	Thomas Sharp, my clerk. Do.	8	-	-		
						229 3 2

B O O K - K E E P I N G .

383

(1)

L E G E R .

Fo.

L E G E R .

Fo. (1)

Dr.		Stock,			
1789	Jan. 1	To Sundries per J.	3	12	7 3
	Apr. 30	To Balance-account, for nett stock	5	528	9 1
				840	16 4

Dr.		Profit and Loss,			
1789	Mar. 4	To Thomas Pirie, discounted him	2	—	3 8
	Apr. 17	To Cash, paid Tho. Smith interest	1	1	10 —
	30	To Royal Bank, for interest due them	2	2	11 2
		To Sundries, per J.		47	1 4
		To Stock, for nett gain	1	16	13 8
				67	19 10

Dr.		Cash,			
1789	Jan. 1	To Stock on hand	1	75	10 —
	15	To Paper, for 5 reams, at 11s	2	2	15 —
	19	To Salt, in part, per J.	3	10	— —
	22	To Sundries for Hen. Hardy's bill, with int.		77	10 —
Feb.	3	To James Cuthbert, in part	3	30	— —
	16	To Sundries, per J.		73	2 6
	19	To Calicoes, for bal. of 100 yards, per J.	3	3	— —
		To Meal, for 30 bolls, at 13s 8d	1	20	10 —
	20	To Royal Bank, drawn on them	2	120	— —
Mar.	4	To Thomas Pirie, in full	2	12	— —
	17	To Clover-feed, in part, for 2 bags	4	5	— —
	21	To Clover-feed, 120lb. at 7½d	4	3	12 6
Apr.	2	To Sundries, per J.		38	15 11
	6	To Royal Bank, drawn on them	2	60	— —
	14	To George Gordon, in part	5	35	— —
	25	To Share of ship Hazard for share profits p. J.	5	33	— —
				599	15 11

Dr.		Meal,	Bolls		
1789	Jan. 1	To Stock on hand, at 13s	200	1	130 —
	30	To Sundries, per J. at 13s 2d	150		98 15
Mar.	2	To Cash, paid charges and loft-rent	—	1	3 3
Apr.	6	To Cash, per J.	70	1	45 16 8
	30	To Profit and loss, for gain	—	1	9 18
		Outcome	3		— —
			423		287 12 8

Dr.		Port-wine,	Hds		
1789	Jan. 1	To Stock on hand, at L 15	6	1	90 —
	Feb. 19	To Calicoes, in barter	13		14 10
	Apr. 30	To Profit and Loss, for gain	1		6 15
			7		111 5

1789		Contra	Cr.			
Jan. 1		By Sundries, per J.		1	824	2 8
Apr. 30		By Profit and Loss, for nett gain		1	16	13 8
					840	16 4

1789		Contra	Cr.			
Jan. 22		By Cash, received int. on Hen. Hardy's bill		1	2	10 —
Apr. 30		By Sundries, per J.			65	9 10
					67	19 10

1789		Contra	Cr.			
Jan. 3		By Calicoes, for 105 yards, at 3s 2d		3	16	12 6
	10	By William Nisbet, in full		3	28	7 3
	22	By Royal Bank, paid them		2	100	— —
	26	By Yarn, in part, for 500 sp. four hank		2	15	— —
	30	By Meal, paid balance of 150 bolls		1	2	15 —
Feb. 16		By Royal Bank, paid them		2	100	— —
	21	By Sundries, per J.			117	18 4
Mar. 2		By Sundries, per J.			4	5 6
	12	By Clover-feed, paid freight and charges		4	1	5 —
	17	By Sundries, paid Tho. Smith, with int. per J.			20	10 —
Apr. 6		By Sundries, per J.			78	16 8
		By William Ainslie, paid him		5	30	— —
	16	By Baillie and Bell, paid their bill on me ft.		4	38	8 2
	30	By Sundries, for charges and expences per J.			37	3 8
		By Balance-account		5	8	3 10
					599	15 11

1789		Contra	Cr.	Bolls		
Jan. 3		By James Cuthbert, at 13s 3d		50	3	33 2 6
Feb. 10		By Yarn in barter, at 13s 6d		30	2	20 5 —
	19	By Sundries, per J.		154		106 5 4
Apr. 2		By Cash, at 13s 7d		30	1	20 7 6
	14	By George Gordon, at 13s 8d		35	5	23 18 4
	30	By Balance-account at 13s 4d		124	5	83 14 —
				423		287 12 8

1789		Contra	Cr.	Hds		
Jan. 10		By Meal, in barter, at L 16		6	1	96 — —
Mar. 28		By Baillie and Bell		14		15 5 —
				7		111 5 —

Dr.

(2)

L E G E R .

Fo.

L E G E R .

Fo. (2)

Dr.		Paper,	R.			
1789	Jan. 1	To Stock on hand, at 10s 6d	70	1	36	15
	Apr. 30	To Profit and Loss, for gain		1	4	18 6
			70		41	13 6
Dr.		Yarn,	Spindles			
			4 H 5 H			
1789	Jan. 1	To Stock on hand, at 2s 3d	120	1	13	10
	26	To Sundries, per J. at 1s 11d	500		47	18 4
	Feb. 10	To Sundries, per J. at 2s	334 $\frac{1}{2}$		33	9
	Apr. 30	To Profit and Loss, for gain		1	2	3 2
			834 $\frac{1}{2}$	120	97	6
Dr.		House in Lawn-market,				
1789	Jan. 1	To Stock, for value		1	300	
Dr.		Ja. Boswell merchant Edinburgh,				
1789	Jan. 1	To Stock due by him, per account		1	73	4
	15	To Paper, for 30 reams, at 12s		2	18	
	Feb. 2	To Sundries, per J.			27	17
	Mar. 17	To Clover-seed, for bal. of 2 bags, per J.		4	1	10
	Apr. 11	To Train-oil, for 20 casks, at 27s		5	27	
					147	11
Dr.		Thomas Pirie writer Edinburgh,				
1789	Jan. 1	To Stock due by him per account		1	12	3 8
Dr.		Henry Hardy merchant Glasgow,				
1789	Jan. 1	To Stock due by him per bill		1	75	
	Feb. 19	To Meal, for 45 bolls, at 13s 10d		1	31	2 6
Dr.		David Miller manufacturer Haddington,				
1789	Jan. 1	To Stock due by him per receipt,		1	18	
Dr.		Royal Bank of Scotland,				
1789	Jan. 22	To Cash, paid them		1	100	
	Feb. 16	To Cash, paid them		1	100	
	Mar. 24	To Ja. Boswell, paid them by him		2	40	
	Apr. 30	To Balance-account		5	201	3 2
					441	3 2

1789		Contra	Cr.			
Jan. 15	By Sundries, per J.		47	27	19	
Feb. 10	By Yarn in barter, at 12s		22 2	13	4	
	By Charges Merchandize, for shop-use		14		10 6	
			70	41	13 6	
1789		Contra	Cr.			
				4 H 5 H		
Jan. 5	By Diaper, at 2s 4d		60 3	7		
Feb. 2	By James Boswell, at 2s 3 $\frac{1}{2}$		60 2	6	17 6	
Mar. 5	By James Dalton, per J.		360		35 13	
Apr. 30	By Balance-account, at 2s Amiffing		474 $\frac{1}{2}$	5	47 8	
			834 $\frac{1}{2}$	120	97	6
1789		Contra	Cr.			
Apr. 30	By Balance-account		5	300		
1789		Contra	Cr.			
Feb. 16	By Cash in part		1	70		
Mar. 24	By Royal Bank, paid in by him		2	40		
Apr. 30	By Balance-account		5	37	11	
				147	11	
1789		Contra.	Cr.			
Mar. 4	By Sundries in full, with discount, per J.			12	3 8	
1789		Contra	Cr.			
Jan. 22	By Cash in full		1	75		
Apr. 30	By Balance-account		5	31	2 6	
1789		Contra	Cr.			
Apr. 38	By Balance-account		5	18		
1789		Contra	Cr.			
Jan. 1	By Stock, due them per account		1	230		
Feb. 23	By Cash, drawn on them		1	120		
Apr. 6	By Cash, drawn on them		1	60		
24	By J. Jonkheer, for his bill paid them, p. J.		4	28	12	
30	By Profit and Loss, for interest due them		1	2	11 2	
				441	3 2	

B O O K K E E P I N G .

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(3) L E G E R .				L E G E R .			
Dr.				Cr.			
1789				1789			
Feb. 23 To Cash, paid his bill on me at sight				Jan. 1 By Stock, due him per account			
Mar. 17 To Cash, in full							
Dr.				Contra			
1789				Cr.			
Jan. 10 To Cash, paid him in full				1789			
				Jan. 1 By Stock, due him per account			
Dr.				Contra			
1789				Cr.			
Jan. 3 To Cash, at 3s 2d				1789			
Apr. 30 To Profit and loss, for gain				Feb. 19 By Sundries, per J. at 3s 6d			
				Apr. 19 By proper Expences taken at 3s 2d			
Dr.				Contra			
1789				Cr.			
Jan. 3 To Meal, for 50 bolls, at 13s 3d				1789			
Mar. 21 To Clover-feed, for 70lb. at 7½d				Feb. 3 By Cash in part			
				Apr. 30 By Balance account			
Dr.				Contra			
1789				Cr.			
Jan. 5 To Yarn in barter, at 1s 9d.				1789			
Apr. 30 To Profit and Loss, for gain				Apr. 2 By Cash at 1s 11d			
				3 By William Ainslie, at 2s			
Dr.				Contra,			
1789				Cr.			
Jan. 13 To William Bruce, at 1s 8d				1789			
Mar. 2 To Cash, paid charges and cellar-rent				Jan. 19 By Sundries, per J. at 1s 9d			
				Feb. 2 By J. Boswell, for the rem. at 1s 8½d			
				Apr. 20 By Profit and Loss, Inlake			
Dr.				Contra,			
1789				Cr.			
Feb. 23 To cash in part				1789			
Apr. 30 To Balance-account				Jan. 3 By Sundries, per J.			
Dr.				Contra,			
1789				Cr.			
Jan. 13 To William Bruce, at 3s 4d				1789			
Apr. 30 To Profit and Loss, for gain				Feb. 2 By James Boswell, at 3s 4½d			
				Mar. 28 By Baillie and Bell, at 3s and 7d			
				Apr. 2 By Cash, at 3s 6½d			
				30 By Balance-account, at 3s 4d			

(4)

L E G E R .

FO.

Dr.		<i>Jo. Henderson stationer Edinburgh,</i>			
1789					
Jan. 14	To Paper, for 12 reams, at 12s.	2	7	4	—
Dr.		<i>William Hunter merchant Dunbar,</i>			
1789					
Jan. 19	To Salt, for balance of 150 bushels, per J.	3	3	2	6
Feb. 19	To Meal, for 27 bolls, at 13s 10d	1	18	13	6
Dr.		<i>Alex. Sharp merchant Dundee,</i>			
1789					
Feb. 23	To Cash, in full	1	32	18	4
Dr.		<i>Charges Merchandise,</i>			
1789					
Feb. 10	To Paper, taken for shop-use, 1 ream	2	—	10	6
Apr. 30	To Cash, for small charges since 1st Jan.	1	5	3	8
	To Tho. Sharp, for wages	5	8	—	—
			13	14	2
Dr.		<i>Baillie and Bell Borrowstownness,</i>			
1789					
Feb. 19	To Meal, for 52 bolls, at 3s 10d	1	35	19	4
Mar. 28	To Sundries, per J.		42	2	6
Apr. 16	To Cash, pd their bill on me to C. Cowan, st	1	38	18	2
			117	—	—
Dr.		<i>James Dalton Manchester,</i>			
1789					
Mar. 5	To Yarn, for 360 spindles four hank, per J.	2	35	15	—
Dr.		<i>Clover-feed,</i>			
1789		lb.			
Mar. 12	To Sundries per J. for pr. cost and char.	1200	29	17	—
Apr. 30	To Profit and Loss for gain.	1	5	—	1
		1200	34	17	1
Dr.		<i>J. Jonkheer merchant Rotterdam,</i>			
1789					
Apr. 22	To Ro. Bank, for his bill on me paid by them	2	28	12	—
Dr.		<i>Lint-feed,</i>			
1789		Hds.			
Mar. 17	To Clover-feed, in barter, at 55s.	2	4	5	10
Apr. 30	To Profit and Loss, for gain	1	—	18	—
		2	6	8	—

L E G E R .

FO.

(4)

	Contra,	Cr.			
1789					
Apr. 30	By Balance account	5	7	4	—
	Contra,	Cr.			
1789					
Feb. 16	By Cash in full	1	3	2	6
Apr. 30	By Balance account	5	18	13	6
	Contra,	Cr.			
1789					
Jan. 20	By Yarn, for balance of 300 spindles, per J.	2	32	18	4
	Contra,	Cr.			
1789					
Apr. 30	By Profit and Loss	1	13	14	2
			13	14	2
	Contra,	Cr.			
1789					
Apr. 8	By William Ainslie, paid him by them	5	11	7	—
			117	—	—
	Contra,	Cr.			
1789					
Apr. 7	By balance-account	5	35	15	—
	Contra,	Cr.			
1789		lb.			
Mar. 7	By Sundries, per J.	400	12	—	—
Apr. 17	By Sundries, per J.	330	10	3	9
Apr. 2	By Cash, at 7½d	160	5	3	4
Apr. 30	By Balance account, at 6d Inlake	300	7	10	—
		10	—	—	—
		1200	34	17	1
	Contra,	Cr.			
1789					
Mar. 12	By Clover-feed, for 6 bags. per J.	6	28	12	—
	Contra,	Cr.			
1789		Hds.			
Apr. 2	By Cash	1	1	3	3
Apr. 14	By George Gordon	1	5	3	5
		2	6	8	—

Dr.

BOOK-KEEPING.

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(5)

L E G E R.

FO.

L E G E R.

FO. (5)

<i>Dr.</i> 1789 Mar. 21				<i>John Scott farmer at Haughhead,</i>								<i>Contra</i> 1789 Apr. 30				<i>Cr.</i> By Balance-account			
				To Clover-feed, for 140 lb. at 7½d				4 4 7 6								5 4 7 6			
<i>Dr.</i> 1789 Mar. 25				<i>Share of ship Hazard,</i>								<i>Contra</i> 1789 Apr. 25				<i>Cr.</i> By Cash, for share profit of a voyage to Rot.			
				To William Ainslie, bought ½ share for				5 150								1 33			
Apr. 30				To Profit and Loss,				1 23				30				By Balance-account			
								173								5 140			
<i>Dr.</i> 1789 Apr. 6				<i>William Ainslie merchant Alloa,</i>								<i>Contra</i> 1789 Mar. 25				<i>Cr.</i> By Share of Ship Hazard, for ½ bt. from him			
				To Sundries, per J.				33								5 150			
Apr. 10				To Baillie and Bell, for bal. paid him by them				4 117											
								150											
<i>Dr.</i> 1789 Apr. 6				<i>Train-oil,</i>								<i>Contra</i> 1789 Apr. 11				<i>Cr.</i> By James Boswell, at 27s			
				To Cash, at 22s				30 1 33								20 2 27			
Apr. 30				To Profit and Loss, for gain				1 8				14				By George Gordon, at 28s			
								30 41								10 5 14			
																30 41			
<i>Dr.</i> 1789 Apr. 14				<i>George Gordon merchant Stirling,</i>								<i>Contra</i> 1789 Apr. 14				<i>Cr.</i> By Cash in part			
				To Sundries, per J.				4 3 4								1 35			
												30				By Balance-account			
								4 3 4								5 6 3 4			
<i>Dr.</i> 1789 Apr. 18				<i>Proper Expenses,</i>								<i>Contra</i> 1789 Apr. 30				<i>Cr.</i> By Profit and Loss			
				To calicoes, for 5 yards, at 3s 2d				3 15 10								1 32 15 10			
Apr. 30				To Cash, for charges since 1st January				1 32											
								32 15 10								32 15 10			
<i>Dr.</i> 1789 Apr. 30				<i>Thomas Sharp, my clerk,</i>								<i>Contra</i> 1789 Apr. 30				<i>Cr.</i> By Charges Merchandize, due him for wages			
				To balance-account				5 8								4 8			
<i>Dr.</i> 1789 Apr. 30				<i>Balance-account,</i>								<i>Contra</i> 1789 Apr. 30				<i>Cr.</i> By Sundries, per J.			
				To Sundries, per J.				757 12 3								229 3 2			
																528 9 1			
								757 12 3								757 12 3			

TRIAL-BALANCE.

Dr.				Cr.			
1 Stock	L	312	7 3	L	824	2 8	
Profit and Loss		4	4 10		2	10	—
Cash		599	15 11		591	12 1	
2 Meal	L	277	14 8	L	203	18 8	
Port-wine		104	10 —		111	5 —	
Paper		36	15 —		41	13 6	
Yarn		94	17 4		49	12 6	
3 House in Edinburgh		300	— —		—	— —	
			813 17 —			406 9 8	
3 James Boswell	L	247	11 —	L	110	— —	
Henry Hardie		31	2 6		—	— —	
David Miller		18	— —		—	— —	
Royal Bank		140	— —		441	3 2	
			436 13 6			551 3 2	
4 Calicoes	L	16	12 6	L	18	5 10	
James Cuthbert		35	6 3		30	— —	
Diaper		7	— —		7	15 10	
Salt		17	15 10		17	4 6	
			76 14 7			73 6 2	
5 Iron	L	53	6 8	L	49	1 3	
William Bruce		50	— —		70	— —	
John Henderson		7	4 —		—	— —	
William Hunter		18	13 6		—	— —	
Charges Merchandize		13	14 2		—	— —	
			142 18 4			119 1 3	
6 James Dalton	L	35	15 —	L	—	— —	
Clover-feed		29	17 —		27	7 1	
Flax-feed		5	10 —		6	8 —	
John Scott		4	7 6		—	— —	
Share of Ship Hazard		150	— —		39	— —	
			225 9 6			66 15 1	
7 Train oil	L	33	— —	L	41	— —	
George Gordon		41	3 4		35	— —	
Proper Expences		32	15 10		—	— —	
Thomas Sharp		—	— —		8	— —	
			106 19 2			84 — —	
			L2719 — 1			L2719 — 1	

COMPU

BOOK-KEEPING.

COMPUTATIONS.

389

Cash	Dr. L 599 15 11 591 12 1	Cr. L 591 12 1	4 Salt	Dr. L 17 15 10 17 4 6	Cr. L 17 4 6
	L 8 3 10			Loss — 11 4	
2 Meal	L 277 14 8	L 203 18 8	5 William Bruce	L 50 — —	L 70 — —
Dr. 420 bolls	L 83 14 —	83 14 —			50 — —
Cr. 299		L 287 12 8	Iron	L 53 6 8	L 20 — —
121		277 14 8	320 stone	L 6 13 4	L 49 1 3
124			280		6 13 4
3 outcome	Profit L 9 18 —	40			L 55 14 7
Port wine	L 104 10 —	L 111 5 —			53 6 8
		104 10 —	J. Henderson.	Profit L 2 7 11	
	Profit L 6 15 —		W. Hunter	L 7 4 —	
Paper	L 36 15 —	L 41 13 6	Char. Merchan.	L 18 13 6	
		36 15 —		L 13 14 2 loss	
	Profit L 4 18 6		6 Ja. Dalton	L 35 15 —	
Yarn	L 94 17 4	L 49 12 6	Clover-feed	L 29 17 —	L 27 7 1
Spindles	L 47 8 —	47 8 —	1200 lb.		7 10 —
834 1/2 120			890	L 7 10 —	
360 120		L 91 — 6			L 34 17 1
		94 17 4			29 17 —
474 1/2	Profit L 2 3 2		10 intake	Profit L 5 — 1	
Amiffing 1/2	L 300 — —		Lint-feed	L 5 10 —	L 6 8 —
House in Edinburgh					5 10 —
3 Ja. Boswel	L 147 11 —	L 110 — —	J. Scott	Profit L — 18 —	
	110 — —		Share Hazard	L 4 7 6	
				L 150 — —	33 — —
Henry Hardy	L 27 11 —				140 — —
David Miller	L 31 2 6			L 140 — —	
Royal Bank	L 18 — —				L 173 — —
	L 240 — —	L 441 3 2			150 — —
		240 — —		Profit L 23 — —	
		L 201 3 2	7 Train-oil	L 33 — —	L 41 — —
4 Calicoes	L 16 12 6	L 18 5 10			33 — —
		16 12 6	George Gordon	Profit L 8 — —	
	Profit L 1 13 4			L 41 3 4	L 35 — —
J. Cuthbert	L 35 6 3			35 — —	
	30 — —		Proper Ex.	L 6 3 4	
			Thomas Sharp	L 32 15 10 loss	L 8 — —
Diaper	L 5 6 3				
	L 7 — —	L 7 15 10	STOCK	L 312 7 3	L 824 2 8
		7 — —	Balance	528 9 1 prof.	16 13 8
	Profit L — 15 10				
				L 840 16 4	L 840 16 4

PROFIT

B O O K - K E E P I N G .

P R O F I T A N D L O S S S H E E T .

Salt
Charges Merchandize
Proper Expences

In Leger

Nett gain

L— 11 4
13 14 2
32 15 10

L47 1 4
4 4 10

L51 6 2

16 13 8

L67 19 10

Meal
Port-wine
Paper
Yarn
Calicoes
Diaper
Iron
Clover-feed
Lint-feed
Share of ship Hazard
Train-oil

L 9 18—

6 15 —

4 18 16

2 3 2

1 13 4

— 15 10

2 7 11

5 — 1

— 18 —

23 — —

8 — —

L65 9 10

2 10 —

L67 19 10

— — —

B A L A N C E - S H E E T .

Cash
Meal, 124 b. at 13s 4d
Yarn, 474 sp. at 2s
Amiffing 1/2
House in Edinburgh
James Boswell
Henry Hardie
David Miller
J. Cuthbert
Iron, 40 stone, at 3s 4d
J. Henderson
W. Hunter
James Dalton
Clover-feed, 300 lb. at 6d
Inlake 10 lb.
J. Scott
Share of ship Hazard
George Gordon

L 8 3 10

83 14 —

47 8 —

300 — —

37 11 —

31 2 6

18 — —

5 6 3

6 13 4

7 4 —

18 13 6

35 15 —

7 10 —

4 7 6

140 — —

6 3 4

L757 12 3

Meal, outcome 3 b.
Royal Bank
William Bruce
Thomas Sharp

L201 3 2

20 — —

8 — —

L229 3 2

STOCK

528 9 7

L757 12 3

The present article, it is hoped, will appear sufficiently extended for a work of this nature. It contains the general principles of Italian book-keeping; and is sufficient to unfold the nature and design of that art to the speculative inquirer, to direct the accountant in common and easy cases, and prepare him for understanding those that are more complicated. In fact, if he has a clear apprehension of the sense of the transactions, the tendency of the journal entries, and the import of the balances in the ledger, he will seldom be at a loss how to proceed.

Subsidiary Books used by merchants.

Though all merchant-accounts may be kept by the *Waste-book*, *Journal*, and *Leger*, alone; yet men of great business find it convenient, either for abridging these, or for other ends, to use some others, generally called *Subsidiary* or *Subservient Books*; the most common of which are these nine following, viz.

1. *Cash-Book*. This book is kept in a folio form, like the ledger, and serves to abridge the cash account there. On the left-hand page, or Dr. side, *Cash* is charged Dr. for all the sums received; and on the right-hand page, *Cash* is made Cr. for all the sums paid. Once a-week, or, which is more ordinary, once a month, this book is posted to the ledger; or, if you please, first to the journal, by two entries, viz. *Cash* Dr. to *Sundries*, for all the receipts, and *Sundries* Drs. to *Cash*, for all the payments. By this means the cash account in the ledger will be so far contracted as to consist of 12 lines, viz. one for each month in the year.

2. *Book of Charges of Merchandize*. This book is only paged, and designed to abbreviate the cash-book. It contains particular charges on goods and voyages; such as carriage, custom, freight, crantage, wharfage, &c.: as also other expences that affect trade in general; such as, warehouse-rent, shop-rent, accountant's wages, postage of letters, and the like. At the end of each month the money-columns of this book are added up, and the sum carried to the credit-side of the cash-book.

3. *Book of House-expences*. This book is also paged, and designed likewise to ease the cash-book. It contains all disbursements for family provisions, servants wages, house-rent, apparel, utensils &c. The money-columns of this book are also added up at the end of each month, and the sum transferred to the credit-side of the cash-book.

4. *Invoice-book*. This book, which is used chiefly by factors, is paged, and contains doubles or copies of the invoices of goods sent to sea, or of goods received from abroad.

5. *Sales-book*. This book too is chiefly used by factors; and into it is posted, from the waste-book, the particular sales of every consigned cargo; by which means the several articles of a sale, that lie scattered in the waste-book, are brought together, and represented under one view, and that in a manner more full and minute than they are collected in the ledger account.

This book exhibits the sales of every consignment separately and by themselves: to which are subjoined the respective charges, such as freight, custom, the factor's commission, as also abatements allowed to buyers, &c. whose sum subtracted from the gross amount of sales gives the neat proceeds. From this book, when a cargo is sold off, an account of sales is drawn out, in order to be transmitted to the employer.

6. *Bill-book*. The design of this *Bill-book*, or *Month-book*, is to furnish a merchant with a ready way of knowing the time when bills or other debts become payable to or by him. It consists of 12 folios, one for each month in the year. The left-hand page contains the debts that fall due to the merchant in the month on the top, and the right-hand page contains the debts payable by him to others in the same month.

7. *Receipt-book*. In this book a merchant takes receipts of the payments he makes. The receipt should contain the date; the sum received, expressed in words at large, and also in figures in the money-columns; the reason why; and whether in full or in part; and must be signed by the person receiving. But there is no occasion to mention the merchant's name; for the book being his own, sufficiently implies that.

8. *Letter-book*. It is very imprudent in any person to send away a letter of business, without keeping a double of it to himself; and therefore to prevent the bad consequences of such a careless practice, merchants are provided with a large book in folio, into which is copied *verbatim* every letter of business before it be sent off. So that this book, together with the letters received (which must also be carefully kept in files or boxes), makes a complete history of all the dealings that pass betwixt a merchant and his correspondents; which may be very useful and necessary on many occasions.

9. *Pocket-book*. This is a small book, of a portable size, which a merchant carries in his pocket when business calls him abroad to a tavern, a fair, the country, or other places. In this he sets down the bargains he makes, the expences he is at, the debts he pays, or sums he receives, with every other part of business he transacts while abroad; as also any occurrence or piece of news he thinks worth while to record. And when he comes home to his counting-house or shop, he transfers the things contained in this book, each to their proper places in the waste-book, or books subsidiary.

Factors of great business sometimes keep another small book, called the *Memorandum-book*. Into this book is copied, from letters as they come to hand, short notes of the several commissions for buying goods contained in them; and as the commissions are effected, the notes are crossed, or have some mark affixed to them. This is more convenient in doing business, than to be continually running to the letters themselves.

The above are the subsidiary books most in use: but a merchant is not tied down or restricted to them; he may keep some, and neglect others, or invent more as the nature of his business requires, and he finds convenient.

B O O

BOOKSELLER, one who trades in books, whether he prints them himself, or gives them to be printed by others.

B O O

BOOKSELLERS, among us, are the same with *bibliopole* among the ancients, whose office was distinct from that of *librarii*. Petty dealers, or venders of small ware,

Bookfeller

ware, like our publishers, were more particularly denominated *libelliones*. At Rome, the Argiletum was the mart of books, as Paul's Church-yard, or Fleet-street, and Paternoster-row, have been among us: whence that of Martial.

*Argiletanas mavis habitare tabernas,
Cum tibi, parve liber, scrinia nostra vacent.*

Bookfellers in many places are ranked among the members of universities, and intitled to the privileges of students: as at Tubingen, Salisburg, and Paris, where they have always been distinguished from the vulgar and mechanical traders, and exempted from divers taxes and impositions laid on other companies.

Formerly, the offices of bookfellers and printers were united in the same persons. Labbe gives a list of learned bookfellers; most of whom were also authors. Of late, bookfellers have drawn their business into less compass, and leaving the labour of composing books to one set of persons, and that of printing them to another, content themselves with the gainful part; thus ministering to the republic of letters not with the head or the hand, but the purse only. In this view, they have been very important and useful agents between authors and the public; and have contributed, in no small degree, to the encouragement of genius and literary industry, and the spread of science. There are few authors, who have undertaken the printing and publishing of any work likely to be transmitted to posterity, without being connected with some bookfeller, or bookfellers, eminent in their profession.

The fairs of Francfort and Leipzig are famous for the resort of bookfellers, not only from all parts of the empire, but Holland, Flanders, &c. They have each their shop or warehouse, over which is inscribed the name of some celebrated bookfeller of former times; *officina, Elzeviriana, Frobeniana, Morelliana, Janssoniana*, &c.

An acquaintance with the bookfellers marks or signs, frequently expressed on the title-pages of their books, is of some use; because many books, especially in the last century, have no other designation either of printer, bookfeller, or even city. The anchor is the mark of Raphelengius at Leyden; and the same with a dolphin twisted round it, of the Manutii at Venice and Rome; the Arion denotes a book printed by Oporinus at Basil; the caduceus, or pegasus, by the Wecheliuses at Paris and Francfort; the cranes, by Cramoisy; the compass, by Plantin at Antwerp; the fountain, by Vascosan at Paris; the sphere in a balance, by Janfon or Blaew, at Amsterdam; the lily, by the Juntas at Venice, Florence, Lyons, and Rome; the mulberry-tree, by Morel at Paris; the olive-tree, by the Stephenses at Paris and Geneva, and the Elzeviers at Amsterdam and Leyden; the bird between two serpents, by the Frobeniuses at Basil; the truth, by the Commelins at Heidelberg and Paris; the Saturn, by Colnæus; the printing-press, by Badius Ascencius, &c.

The traffic of books was anciently very inconsiderable, inasmuch that the book-merchants of England, France, Spain, and other countries, were distinguished by the appellation of *stationers*, as having no shops, but only stalls and stands in the streets. During this state, the civil magistrates took little notice of the bookfellers, leaving the governments of them to the univer-

sities, to whom they were supposed more immediate retainers; who accordingly gave them laws and regulations, fixed prices on their books, examined their correctness, and punished them at discretion. But when, by the invention of printing, books and bookfellers began to multiply, it became a matter of more consequence; and the sovereigns took the direction of them into their own hands, giving them new statutes, appointing officers to fix prices, and granting licences, privileges, &c.

BOOM, in the sea-language, a long piece of timber with which the clew of the studding sail is spread out; and sometimes the boom is used to spread or boom out the clew of the main-mast.

Boom, denotes also a cable stretched athwart the mouth of a river or harbour; with yards, top-masts, battling or spars of wood lashed to it, to prevent an enemy's coming in.

BOOMING, among sailors, denotes the application of a boom to the sails. A ship is said to come booming forwards, when she comes with all the sail she can make.

BOONEN (Arnold), portrait painter, was born at Dort in 1669, and at first was a disciple of Arnold Verbuys, a painter of history and portrait. Afterwards he placed himself with Godfrey Schalcken, and continued with that artist for six years. The sweetness of his colouring, and the neatness of his touch, with a striking likeness in his portraits, procured him a number of admirers. He painted in the manner of his master, particularly subjects by candle-light, which were very delicate, and very natural; and much more of his work was requested by the lovers of the art than it was possible for him to undertake. He had the honour to paint the portraits of the Czar of Muscovy; of Frederic I. King of Prussia; of the victorious Duke of Marlborough, as well as many of the princes of Germany; and most of the noblemen who attended the Czar. His style of colouring was extremely good, and he had an elegant manner of disposing the attitudes of his figures; his handling was neat, and the whole had so much harmony that he was justly ranked among the ablest artists of his time. The small pictures of Boonen are in the taste of his master Schalcken; but his excessive application, to answer the multitude of his engagements, impaired his health, and destroyed while it enriched him. He died in 1729.

BOOPTHALMUS, a kind of agate with large circles in it, bearing some resemblance to an ox's eye, from whence it has got this name.

BOOPS, in zoology, the trivial name of a species of balæna. See BALÆNA.

BOOSHATTER, formerly the city of Utica, famous for the retreat and death of Cato, lies about seven miles inland from PORTO FARINA in the bay of TUNIS. Nothing remains of its ancient grandeur except part of a large aqueduct, some cisterns, and other magnificent ruins, which cover a large extent of ground, and show it to have been a very considerable place. The sea, it is known, came up anciently to this city, though now seven miles distant.

BOOT, a leathern cover or defence for the leg, used on horseback, both to keep the body more firm, and defend the part from the injuries of the weather. Boots

Boons
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Boots.

Boot

Booth

seem to have taken their name from the resemblance they bear to a sort of jacks or leathern bottles formerly in use, and called *bottle*, in the old French *bouts*. Borel derives the name from the old French word *bot*, a stump, by reason the boot gives the leg this appearance. The Chinese have a kind of boots made of silk or fine stuff lined with cotton, a full inch thick, which they always wear at home. This people are always booted; and when a visit is made them, if they happen to be without their boots, their guest must wait till they put them on. They never stir out of doors without their boots on; and their scrupulousness in this respect is the more remarkable as they are always carried in their chairs.

The boot was much used by the ancients, by the foot as well as by the horsemen. It was called by the ancient Romans *ocrea*; in middle-age writers, *greva*, *gamberia*, *bainberga*, *bembarga* or *benbarga*. The boot is said to have been the invention of the Carians. It was at first made of leather, afterwards of brass or iron, and was proof both against cuts and thrusts. It was from this that Homer calls the Greeks *brazen-booted*. The boot only covered half the leg; some say the right leg, which was more advanced than the left, it being advanced forwards in an attack with the sword; but in reality it appears to have been used on either leg, and sometimes on both. Those who fought with darts or other missile weapons, advanced the left leg foremost, so that this only was booted.

Fishing-Boots, are a thick strong sort used in dragging ponds and the like. *Hunting-boots*, a thinner kind used by sportsmen. *Jack-boots*, a kind of very strong boots used by the troopers.

Boot, is likewise a kind of torture for criminals; to extort a confession, by means of a boot, stocking, or buskin of parchment; which being put on the leg moist, and brought near the fire, in shrinking squeezes the leg violently, and occasions intolerable pain.

There is also another kind of boot; consisting of four thick strong boards bound round with cords: two of these are put between the criminal's legs, and the two others placed one on the outside of one leg and the other on the other; then squeezing the legs against the boards by the cords, the criminal's bones are severely pinched, or even broken, &c.

The boot is now disused in England and Scotland; but it subsists still in some other countries.

Boot-Tree, or *Boot-last*, an instrument used by shoemakers to widen the leg of a boot. It is a wooden cylinder slit into two parts, between which, when it is put into the boot, they drive by main force a wedge or quoin.

BOOTES, a constellation of the northern hemisphere, consisting of 23 stars according to Ptolemy's catalogue, of 18 in Tycho's, of 34 in Bayer's, of 52 in Hevelius's, and of 54 in Mr Flamsteed's catalogue.

BOOTH (Barton), a famous English actor, born in Lancashire in 1681, and educated in Westminster school under the celebrated Dr Bushby, where his success in the Latin plays customarily performed by the scholars gave him an inclination for the stage. He was intended for the church; but running away from school to Dublin, he there commenced actor. His first appearance was in the part of Oroonoko, in which he came off with every testimonial of approbation from the

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audience. From this time he continued daily improving; and, after two successful campaigns in that kingdom, conceived thoughts of returning to his native country, and making a trial of his abilities on the English stage. To this end, he first, by letter, reconciled himself to his friends; and then, as a farther step towards insuring his success, obtained a recommendation from Lord Fitzharding (one of the lords of the bed-chamber to prince George of Denmark) to Mr Betterton, who with great candour and good nature took him under his care, and gave him all the assistance in his power. The first part Mr Booth appeared in at London was that of Maximus in Lord Rochester's *Valentinian*, his reception in which exceeded even his most sanguine expectations; and very soon after his performance of Artaban, in Rowe's *Ambitious Step-mother*, which was a new tragedy, established his reputation as second at least to his great instructor. Pyrrhus, in the *Distressed Mother*, was another part in which he shone without a rival. But he was indebted to a happy coincidence of merit and chance, for that height of fame which he at length attained in the character of Cato, as drawn by Mr Addison, in 1712. For this play being considered as a party one, the whigs, in favour of whose principles it was apparently written, thought it their duty strongly to support it, while at the same time the Tories, who had too much sense to appear to consider it as a reflection on their administration, were still more vehement in their approbation of it, which they carried to such an height, as even to make a collection of 50 guineas in the boxes during the performance, and present them to Mr Booth, with this compliment, "That it was a slight acknowledgment for his honest opposition to a perpetual dictator, and his dying so bravely in the cause of liberty." Besides this, he had a present of an equal sum from the managers, in consideration of the great success of the play, which they attributed in a good measure to his extraordinary merit in the performance; and certain it is, that no one since that time has ever equalled, or even nearly approached, his excellence in that character.—But these were not the only advantages which were to accrue to Mr Booth from his success in this part; for Lord Bolingbroke, then one of the principal secretaries of state, in a little time after procured a special licence from queen Anne, recalling all the former ones, and nominating Mr Booth as joint manager with Wilks, Cibber, and Dogget; none of whom were pleased at it; but the last especially took such disgust as to withdraw himself from any further share in the management. In 1704, Mr Booth had married a daughter of Sir William Barkham Bart. who died in 1710, without issue. Being now established in the management, he once more turned his thoughts towards matrimony; and in the year 1719 united himself to the celebrated Miss Hester Santlow, a woman of a most amiable disposition, whose great merit as an actress, added to the utmost discretion and prudential œconomy, had enabled her to save up a considerable fortune. During the 20 years in which Mr Booth continued a manager, the theatre was in the greatest credit; and his illness and death, which happened on the 10th of May 1733, contributed not a little to its decline.

Mr Booth wrote a dramatic entertainment called *Dido and Æneas*; but his master-piece was a Latin in-

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scription

Booth.

Booty
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Borak.

scription to the memory of Mr William Smith, a celebrated actor, who died while he was young.—As an actor, his excellency lay wholly in tragedy, not being able to endure such parts as had not strong passion to inspire him. And even in this walk, dignity rather than complacency, rage rather than tenderness, seemed to be his taste. For a particular idea of his abilities, we must refer to the description Mr Cibber has given of him in his Apology; and the admirable character drawn of him by that excellent judge of dramatic perfection, Aaron Hill, Esq; in a political paper published by him called the *Prompter*, which may be seen at length in Theoph. Cibber's Lives of the Poets, and Chetwood's History of the Stage.—His character as a man was adorned with many amiable qualities, among which, a goodness of heart, the basis of every virtue, was remarkably conspicuous; and so particularly was he distinguished and caressed, and his company sought by the great, that, as Chetwood relates of him, not one nobleman in the kingdom had so many sets of horses at command as he had.

BOOTY, whatever is taken from an enemy in time of war.—Among the Greeks, the booty was divided in common among the army, the general only claiming a larger share. By the military discipline of the Romans, spoils taken from the enemy belonged to the republic, particular persons having no right to them. The generals who piqued themselves on their probity carried it wholly to the public treasury. Sometimes indeed they divided it among the soldiery, to animate them, and serve in lieu of a reward. But this distribution depended on the generals, who were to conduct themselves herein with great equity and moderation; otherwise it became a crime of peculate to lay hands on the pillage, as regularly belonging only to the state. The consuls Romulus and Vaturius were condemned for having sold the booty taken from the Equi.—Among the Jews, the booty was divided equally between the army and the people, though under the kings a different kind of distribution obtained.—Among the Mahometans, two thirds of the spoils are allowed to the army: the other third to God, to Mahomet and his relations, and to the orphans, the poor, and the pilgrims.—Among us, formerly the booty was divided among the soldiery. If the general be in the field, every body takes what he can lay hold on: if the general be absent, the booty is distributed among the soldiery, two parts being allowed to the cavalry, and one to the infantry. A captain is allowed ten shares, a lieutenant six, and a cornet four.

BOPPART, a town of Germany, in the circle of the Rhine, and electorate of Treves; it is seated at the foot of a mountain near the Rhine, in E. Long. 7: 35. N. Lat. 50. 19.

BOPSINGEN, a town of Suabia in Germany, seated on the river Egar, in E. Long. 9. 55. N. Lat. 48. 51.

BOQUINIANS, in church-history, a sect of heretics, so called from Boquinus their founder, who taught that Christ did not die for all mankind, but only for the faithful, and consequently was only a particular Saviour.

BORAGO, in botany, a synonyme of the ANCHUSA.

BORAK, among Mahometans, a fabulous animal,

supposed to be of the middle kind between an ass and a mule, whereon their prophet was carried in his nocturnal flight from Jerusalem into the heavens. This animal the Arabians call *Al-Borak*, q. d. *shining*. The night when the journey was performed is called *Lailat al-Meeraga*, i. e. *the night of ascension*; and the flight itself *Al-Mesra*; concerning which there are a multitude of Traditions.

BORAX, in chemistry, a salt in appearance somewhat similar to crystals of alum, brought originally from the East Indies in an impure state, and afterwards freed from its impurities by certain processes in the European countries. It was long a matter of uncertainty whether this salt be a natural or factitious substance in those countries from whence it is brought; but it is now beyond a doubt, that it is naturally produced in the mountains of Thibet, from whence other parts of the eastern continent are supplied. Mr Kirwan, in his mineralogy, informs us, that Mr Grill Adamson sent some to Sweden in the year 1772, in a crystalline form, as dug out of the earth in the kingdom of Thibet, where it is called *pounxa*, *my poun*, and *houi poun*. It is said to have been found in Saxony in some coal-pits.

In the Philosophical Transactions, vol. 77. we have two different accounts of the place where it is found, and the manner of obtaining it. One of these is by William Blane, Esq; who tells us that in the language of the country it is called *swagah*, and is brought into Hindostan from the mountains of Thibet. It is produced in the kingdom of Jumlate, about 30 days journey north from Betowle, a small principality about 200 miles N. E. of Lucknow. The place where it is found is said to be a small valley surrounded with snowy mountains, in which is a lake about six miles in circumference; the water of which is constantly so hot that the hand cannot bear it for any time. Around this lake the ground is perfectly barren, not producing even a blade of grass; and the earth is so full of a saline matter, that after falls of rain or snow it concretes in white flakes on the surface like the natron of Hindostan. On the banks of this lake, in the winter season, when the falls of snow begin, the earth is formed into small reservoirs six inches high: when these are filled with snow, the hot water from the lake is thrown upon it; which, together with the water from the melted snow, remains in the reservoir, to be partly absorbed by the earth and partly evaporated by the sun; after which there remains at the bottom a cake of sometimes half an inch thick of crude borax, which is taken up and reserved for use. It can only be made in the winter season, because the falls of snow are indispensably requisite, and also because the saline appearances upon the earth are strongest at that time. When once it has been made on any spot, it cannot be made again on the same until the snow has fallen and dissolved three or four times, when the saline efflorescence appears as before. The borax, in the state in which it is taken off the earth, is carried from hill to hill upon goats, and passes through many hands, which increases the difficulty of obtaining any authentic information concerning the original manufacture. When brought down from the hills, it is refined from the gross impurities by boiling and crystallization. Our author could obtain no answer from those who gave him the account, to any of his questions concerning the quality of the water

Borax.

Borax. ter and the mineral productions of the soil. All they could tell him was, that the water was very hot, very foul, and as it were greasy; that it boils up in many places, and has a very offensive smell; and that the soil is remarkable only for the saline appearances already mentioned. The country in general produces considerable quantities of iron, copper, and sulphur; and our author was assured that all the borax in India came from this place.

As this part of Asia is entirely unfrequented by Europeans, our author could only obtain his information from the natives: however, as he had an opportunity of seeing some of those who resided near the spot, it might be reckoned as genuine as could well be expected. The place, he tells us, is inaccessible not only to the Europeans, but even to the inhabitants of Indostan, being never visited by any of them except a few wandering Faquirs, who have been sometimes led there, either with a view to visit some of the temples in the mountains, or to do penance. They describe the cold in winter to be so intense, that every thing is frozen up; and life can only be preserved by loads of blankets and skins. In the summer, again, the reflection of heat from the sides of the mountains, which are steep and close to one another, renders the heat intolerable. With respect to the credibility of the account, he observes, first, "That borax is really brought from the mountains of Thibet is certain, as he himself often had occasion to see large quantities of it brought down, and had purchased it from the Tassar mountaineers, who brought it to market; secondly, he had never heard of its being produced or brought into India from any other quarter; and, thirdly, if it was made on the coast of Coromandel, as some books mention, he thinks there can be little doubt but that the whole process would have been fully inquired into, and given to the public long before this time."

The other account is from father Joseph de Ravato, president of the mission of Thibet, and sent in a letter to the Royal Society, communicated by Joseph Banks, Esq; He pretends also to have had his intelligence from a native of the country where the borax is made, though it differs very considerably from that of Mr Blane. "In the province or territory of Marme (says he), 28 days journey to the north of Nepal, and 25 to the west of Lassa, the capital of Thibet, there is a vale about eight miles broad. In a part of this vale there are two villages or castles, the inhabitants of which are wholly employed in digging the borax which they sell into Thibet and Nepal, they having no other means of subsistence, the soil being so barren as to produce nothing but a few rushes. Near these two castles there is a pool of a moderate size, and some smaller ones, where the ground is hollow and the rain water collects. In these pools, after the water has been some time detained in them, the borax is formed naturally: the men wading into the water, feel a kind of pavement under their feet, which is a sure indication that borax is there formed; and there they accordingly dig it. Where there is little water, the layer of borax is thin; where it is deep, it is thicker; and near the latter there is always an inch or two of soft mud, which is probably a deposit of the water after it has been agitated by rain or wind. Thus is the borax produced merely by nature, without either boiling or distillation.

The water in which it is formed is so bad, that the drinking a small quantity of it will occasion a swelling of the abdomen, and in a short time death itself. The earth that yields the borax is of a whitish colour; and in the same valley, about four miles from the pools, there are mines of salt, which is there dug in great abundance for the use of all the inhabitants of these mountains, who live at a great distance from the sea. The natives, who have no other subsistence on account of the sterility of the soil, pay nothing for digging borax; but strangers must pay a certain retribution, and usually agree at so much per workman. Ten days journey farther north, there is another valley named *Tapre*, where they dig borax; and another still farther to the northward, named *Cioga*. Borax, in the Hindoo and Nepalese languages, is called *Soaga*. If it be not purified, it will easily deliquesce; and in order to preserve it for any time till they have an opportunity of selling it, the people often mix it with earth and butter. In the territory of Mungdan, 16 days journey to the north of Nepal, there are rich mines of arsenic; and in various other places are found mines of sulphur, as also of gold and silver, whose produce is much purer than those of the mines of Pegu."

Mr Fourcroy informs us, that borax is found in commerce in three different states. 1. Crude borax, tincal, or chrysolcolla, which comes from Persia. He describes it as consisting of a greenish mass of a greasy feel, or in opaque crystals of an olive green, which are six-sided prisms terminated by irregular prisms. There are two varieties of these crystals, differing in magnitude: this salt is very impure by the addition of foreign matters. Mr Kirwan tells us, that this kind is called *brute borax*, *tincal*, or *chrysolcolla*, and that it is in the form of large, flat, hexangular, or irregular crystals, of a dull white or greenish colour, greasy to the touch; or in small crystals, as it were cemented together by a rancid, yellowish, oily substance, intermixed with marl, gravel, and other impurities. Mr Engestrom, he adds, has a suspicion that the tincal is only the residuum of the mother liquor of borax evaporated to dryness; and that the greasiness arises from its being mixed with butter-milk, to prevent its efflorescence.

2. Borax of China is somewhat purer than the foregoing, and is met with in the form of small plates or masses irregularly crystallized, and of a dirty white. It appears to consist of fragments of prisms and pyramids confounded together without any symmetrical arrangement: a white powder is observed on the surface, which is thought to be of an argillaceous nature.

3. The Dutch or purified borax, in the form of portions of transparent crystals of considerable purity. Pyramids with several facets may be observed among them, the crystallization appearing to have been interrupted. "This form (says Mr Fourcroy) shows to a certainty that the Dutch refine this salt by solution and crystallization."—Mr Kirwan says, that it is purified by solution, filtration, and crystallization; and the crystals thus obtained are calcined, to free them still farther from greasiness; and then dissolved, filtered, and crystallized, a second time. Sometimes more mineral alkali is added, as tincal is said to contain an excess of sedative salt. Mr Fourcroy tells us, that a purified borax, not inferior to the Dutch, but perhaps

Borax.

even of greater purity, is prepared by some chemists at Paris.

The same author informs us, that M. La Pîame, an apothecary at Paris, has discovered, that it is continually formed in the soap-suds and refuse-waters of the kitchen, which a person preserves in a kind of ditch; and from which, at the end of a certain time, he obtains true borax in fine crystals. "All that we can deduce (says he) from the known facts, concerning its formation, is simply, that it is produced in stagnant waters which contain fat matters." Some authors affirm, that it is produced by art in China. A mixture of grease, clay, and dung, is said to be deposited in a ditch, *stratum superstratum*. This mixture is sprinkled with water, and suffered to remain for some years; at the end of which time it is lixiviated, and affords crude borax by evaporation. Others have supposed that it is obtained from water, which filters through copper mines. Mr Beaumé positively asserts, that the former of these processes succeeded very well with him; but Dr Black gives little credit to his assertions.

Borax serves as a flux to vitrifiable earths, with which it forms a good glass, and is employed in making artificial gems. It vitrifies clay, but much less completely than siliceous earths; and from this property it adheres to the insides of crucibles, and glazes them.

Borax, as is related at length under the article CHEMISTRY, is a peculiar neutral salt formed by the union of a kind of acid with mineral alkali. This acid, from some supposed properties of allaying the heat of fevers, had the name of *sal sedativus*, which it still retains. It has been supposed to be an artificial product, and perhaps may be artificially made: but Mr Hoefer, apothecary to the grand duke of Tuscany, has discovered that the waters of several lakes of that country contain it in a state of great purity; and the chemists of the academy of Dijon have confirmed this discovery by analysing the waters of Monte Rotondo, which were sent to them; and in which they found sedative salt, as discovered by Mr Hoefer. It is probable (says our author) that it may hereafter be found in other mineral waters; and it seems to be produced by the putrefaction of fat substances.

Mr Hoefer first discovered this acid in the waters of the Lagoon named *Cerchiaio* near Monte Rotondo, of which discovery an account was published in the year 1778. The same was found, in a concrete state, by Mr Paul Mascagni professor of Anatomy, in several streams of the Lagoon in the neighbourhood of Sienna and Volterra. He enumerates six places; viz. the lake of *Travale*, 20 miles to the west of Sienna; that of *Rotondo*, which lies 30 miles to the westward of the same town; of *del Saffo*, three miles further; at another called *Sarazzano*, six miles from Monte Rotondo; another named *Castel Nuovo*, seven miles from Monte Rotondo and 24 from Sienna; and that of *Monte Cerboli*, four miles distant from *Castel Nuovo*. In the neighbourhood of all these lakes are considerable springs of hot water rushing out of the earth, some clear, and some muddy; either of a dark or a whitish colour; and, in some, a kind of metallic crust or pellicle is perceived on the surface of the water. Many cavities from which the waters rush out seem to be true small volcanic craters, and continually emit from the earth vapours of a sulphureous and ammoniacal na-

ture. These waters not only contain the acid of borax, both in the fluid and concrete state, but various other concretions are there observed, such as martial vitriol, ammoniacal, aluminous, concrete boracic salts, brimstone, &c.

"It is remarkable (says our author, p. 363.), that near 40 years ago, Dr Hill, in his notes to *Theophrastus's Treatise on Stones*, asserted, that borax was a salt made by evaporation of an ill tasted and foul water, of which there were springs in Persia, Muscovy, and Tartary. But he was hardly believed, on account of the many bold and groundless assertions of which he had been found guilty in almost all his numerous works. Mr Beaumé at Paris pretended to have discovered the method of making the sedative salt by a long maceration of greasy and earthy substances; but nobody has yet been able to verify this fanciful discovery.

"The unrefined borax which is brought to Europe under the name of *tincal*, looks like soft soap, is fat, and covers or encrusts the borax crystals. The mine-master, Mr Swab, has published some experiments upon this tincal in the acts of the Royal Academy of Sciences at Stockholm for 1756. He found in it a martial earth, and a fat substance, which to smell and other circumstances comes nearest to a mineral fat: as also, that pure borax does not yield any *hepar sulphuris* when united with a phlogiston and a vitriolic acid: from which he concludes, that borax is prepared from its own particular mineral substance.

"Professor Pott and M. d'Henouville have very carefully examined the refined borax; and from their experiments, which have been published, it is evident, that it is of a peculiar nature. However, there remains to be known, for certain, from whence it is prepared by the Indians: for if it is produced from a mineral substance, as is very probable, there must exist other mixtures and compositions as yet unknown to the learned world.

"I have also found in the tincal small bits of leather, bones, and small pebbles, whence there is no certainty to be concluded on from its examination; but if it should happen that it is prepared from animal substances, it must be allowed, that nature has formed an alkaline salt in the animal kingdom analogous to the *sal fusibile microcosmicum*. Some years ago a report was propagated from Saxony, that somebody had discovered there a substance out of which borax could be made, and also the art of preparing it: but nothing more has transpired since, than that the author showed it in secret to his friends, and gave a description of it which was only intended to mislead them, if he really did possess the art."

According to Mr Kirwan, 100 parts of purified borax contain 32 of real boracic acid, 17 of mineral alkali, and about 47 of water; but of this quantity of mineral alkali only about five parts are saturated; whence, in many cases, borax acts as an alkali. Bergman informs us, that it requires an equal weight of acid to make the alkaline properties entirely disappear; and Dr Withering, that double the quantity of acid is required for this purpose, both in the tincal and refined borax.

This acid, like the borax in substance, is made use of to fuse vitrifiable earths, with which it forms clear and nearly colourless glasses: by the assistance of heat it dissolves

Borax.

* See *Chemistry*.

Magellan's Notes on Gronstedt's Mineralogy, p. 315.

Borbeto-
magus
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Borde.

dissolves the earth precipitated from the liquor of flints. It unites with ponderous earth, magnesia, lime, and alkalis, and forms with these different substances, salts distinguished by one general name of borax, though only that formed by the combination of sedative salt and mineral alkali is used in the arts. It is used in many other chemical operations as a flux, besides that of glass-making; and the dyers also use it for giving a gloss to silks. In medicine it has been given as a narcotic, and was formerly an ingredient in a powder for promoting delivery, but is now disused.

BORBETOMAGUS, (anc. geog.), a city of the Vangiones on the Rhine; now *Worms*, in Germany.

BORBONIA, in botany: A genus of the decandria order, belonging to the diadelphia class of plants; and in the natural method ranking under the 32d order, *Caryophyllae*. The stigma is emarginated; the calyx has pointed spines; and the legumen is pointed.—There are six species, all of which are natives of warm countries. They are a kind of broom; and in the places where they grow naturally, they rise to the height of ten or twelve feet, but in Europe seldom rise more than four or five. They must be kept constantly in the stove, and may be propagated by laying down the young shoots; but as these are generally two years before they put forth proper roots, the most eligible method is by seeds, which must be procured from those places where they grow naturally, as they do not come to perfection in this country.

BORBORITES, in church-history, a sect of ignominious, in the second century, who, besides embracing the errors of these heretics, denied the last judgment. Their name comes from the Greek *Borbore*, "filth;" on account of a custom they had of daubing their faces and bodies with dirt and filth.

BORCH, a town of the duchy of Magdeburgh in Lower Saxony, seated on the river Elbe, in E. Long. 12. 14. N. Lat. 52. 25.

BORCHLOEN, a town of the bishopric of Liege in Germany, situated in E. Long 5. 28. N. Lat. 50. 50.

BORCOVIUM, (anc. geog.), a town of the Otadini in Britain, now *Berwick on Tweed*.

BORD-HALFPENNY, a small toll by custom paid to the lord of the town for setting up boards, tables, booths, &c. in fairs and markets.

BORD-Lands, the demesnes which lords keep in their hands for the maintenance of their board or table.

BORD-Lode, a service required of tenants to carry timber out of the woods of the lord to his house. It is also used to signify the quantity of provision which the bordarii or bordmen paid for their bord-lands.

BORD-Service, the tenure of bord-lands, by which some lands in certain places are held of the bishop of London, and the tenants now pay sixpence per acre, in lieu of sending provision anciently for their lord's table.

BORDAT, in commerce, a small narrow stuff, which is manufactured in some parts of Egypt, particularly at Cairo, at Alexandria, and Damietta.

BORDE (Andrew), a physician, was born at Pevensey in Sussex, early in the 16th century, and supposed to have been educated at Westminster school. In his *Introduction to Knowledge*, he says, that he was a student of Oxford; but of what college he does not

mention. He left the university without a degree, and entered himself a brother of a Carthusian convent in or near London; but, not liking the severe discipline of that order, he returned to Oxford and applied himself to the study of physic. Some time after, he embarked for the Continent; and, as he himself expresses it, "travelled through and round about Christendom, and out of Christendom into some parts of Africa." In the years 1541 and 1542, he resided at Montpellier in France, where he was made doctor of physic, and after his return to England was incorporated into the same degree at Oxford. From the preface to his *introduction* above mentioned, it appears that he had been in Scotland, which probably was soon after his return from France. Having now satisfied his inclination for travelling, he settled first at Pevensey where he was born, afterwards at Winchester, and finally in London, where he is said to have become a fellow of the college of physicians, and first physician to king Henry VIII. But, notwithstanding his eminence in his profession, he had the misfortune to spend the latter end of his life in the Fleet prison, where he died in the year 1549. As to his character, Wood says, that "he was esteemed a noted poet, a witty and ingenious person, and an excellent physician." Pits calls him a man of sufficient learning, but too volatile and inconstant. Bale and some others, on the contrary, abuse him grossly. His writings are, 1. A book of the introduction of knowledge, the which doth teach a man to speak part of all manner of languages, &c. Lond. 1542, 4to; dedicated, from Montpellier, to the lady Mary daughter to Henry VIII. It is written partly in verse, and partly in prose, containing 39 chapters, before each of which is a wooden print of a man. 2. The breviary of health, wherein are remedies for all manner of sicknesses and diseases, &c. Lond. 1547, &c. 4to. 3. Dietary of health, Lond. 1576, 8vo. 4. The merry tales of the madmen of Gotham. Printed, says Wood, in the time of Henry VIII. in whose reign, and after, it was accounted a book full of wit and mirth by scholars and gentlemen. Afterwards being often printed, it is now only sold on the stalls of ballad-singers. 5. A right pleasant and merry history of the mylner of Abington, with his wife and his fair daughter, and of two poor scholars of Cambridge. Lond. printed by Richard Jones, 4to. 6. A book of every region, country, and province; which shows the miles and leagues distance from city to city, and from town to town, with the noted things in the said cities and towns. Wood says that the author lent the manuscript of this book to his friend Thomas Cromwell, who lost it, to the great grief of the author, who would otherwise have published it. In this instance, however, the antiquary was misinformed; for it has since been published by Hearne at the end of *Benedictus abbas Peterb. de vita Henrici II.* Oxf. 1735, 8vo. 7. The principles of astronomy, the which diligently persecuted is in a manner a prognostication to the world. Lond. printed by Robert Copland, 12mo. The author says that he wrote this little book in four days, with one old pen without mending.

BORDER, in gardening, is made to inclose parterres, that they may not be injured by walking in them. Borders are made either circular, straight, or incants; and are turned into knots, scrolls, volutes, and other

Borde,
Border.

Borduni
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Borelli.

other compartments. They are rendered very ornamental by the flowers, shrubs, yews, &c. that are raised in them. They are always laid with a sharp rising in the middle; because, if they are flat, they are noways agreeable to the eye: and as for their breadth, the largest are allowed five or six feet, and the smallest commonly four.

BORDUNI, or BORDONE, (Paris), an excellent Italian painter, was born at Venice about the year 1512; and, being of a noble family, had a polite education. He was the disciple of Titian; but has been admired more for the delicacy of his pencil than for the truth of his outlines. He was at the court of France in the reign of Francis I. who had a great esteem for him, and for whom he drew not only abundance of history pieces, but the portraits of several court-ladies, in so fine a manner, that original nature was hardly more charming. He at length returned to Venice, laden with riches and honour; and having gained great reputation in all parts of Italy, died in 1587, aged 75.

BORDURE, in heraldry. See there, n^o 10.

BORE, among engineers, denotes the diameter of the barrel of a gun or cannon, or rather its whole cavity.

BOREAS, a Greek name, now in common use for the north wind. Pezron observes, that anciently Boreas signified the *north-east wind* blowing at the time of the summer solstice. The Greeks erected an altar to Boreas. He is represented on the temple at Athens with his robe before his mouth, as if he felt the cold of the climate over which he presides, agreeably to the description of Ovid, who calls him *gelidus tyrannus*, "the shivering tyrant," Met. vi. ver. 711. But he is usually described by the Roman poets as violent and impetuous; *ibid.* ver. 686—ver. 707. In painting, he is generally represented like an old man with a horrible look, his hair and beard covered with snow or hoar frost, with the feet and tail of a dragon. M. Spierlingius has a treatise in praise of Boreas, wherein he shows the honours paid to him by antiquity. Boreas, according to this author, purifies the air, renders it calm and salubrious, preserves buildings from decay, drives away the plague and other noxious diseases, and expels locusts and other vermin hurtful to the grounds.

BOREL (Peter), a learned physician, was the son of James Borel who published several poems, and was born at Castres in 1620. He applied himself to the study of physic, of which he was created doctor, and practised with great success in the city of Castres. Towards the end of the year 1653, he went to Paris, and was soon after made physician in ordinary to the king. In 1674, he was received into the academy of sciences, and distinguished himself by writing a great number of works. The most esteemed are, 1. *Historiarum & observationum medico physicarum* 2. *Bibliotheca chymica, duodecimo*. 3. *De vero telescopii inventore, cum brevi omnium conspiscillorum historia*. He died in 1678.

BORELLI (John Alphonso), a famous philosopher and mathematician born at Naples the 28th of January 1608. He was professor of philosophy and mathematics in some of the most celebrated universities of Italy, particularly at Florence and Pisa, where he became highly in favour with the princes of the

house of Medici; but having been engaged in the revolt of Messina, he was obliged to retire to Rome, where he spent the remainder of his life under the protection of Christina Queen of Sweden, who honoured him with her friendship, and by her liberality towards him softened the rigour of his hard fortune. He continued two years in the convent of the regular clergy of St. Pantaleon, called the *pious schools*, where he instructed the youth in mathematical studies. He died there of a pleurisy, the 31st of December 1679, in the 72d year of his age. He wrote in Latin, 1. Euclid restored. 2. The theory of the influence of the planets in medicine, deduced from physical causes. 3. Of percussive force. 4. Of natural motions depending upon gravity. 5. An historical and meteorological account of the burning of mount Ætna, in the year 1669. 6. Of the motion of animals; and several other works, some of which are in Italian.

BORGIA (Cæsar), natural son of pope Alexander VI. was a brave general, but a most abandoned villain. See (*History of*) ITALY.—It is incredible what numbers he caused to be taken off by poison, or by the sword; and it is notorious that swarms of assassins were constantly kept in pay by him at Rome, for the sake of removing all who were either obnoxious or inconvenient to him. He experienced various turns of fortune; and was sometimes very prosperous, sometimes the reverse. He very narrowly escaped dying by poison in 1503; for having concerted with the pope a design of poisoning nine newly created cardinals at once, for the sake of possessing their effects, the poisoned wine, destined for the purpose, was by mistake brought to and drank by themselves. The pope died of it; but Cæsar, by the vigour of his youth, and the force of antidotes, after many struggles, recovered. He only recovered to outlive his fortune and grandeur, to see himself depressed, and his enemies exalted; for he was soon after divested of all his acquisitions, and sent a prisoner to Spain, in order to free Italy from an incendiary, and the Italian princes from those dangers which the turbulent and restless spirit of Cæsar made them fear, even though he was unarmed. He escaped from thence; and got safe to Navarre, to king John his brother-in-law, who was then at war with his subjects. Cæsar served as a volunteer in that war, and was killed in 1507.

BORGÓ, an ancient town of Sweden, seated on the gulf of Finland, in the province of Nyland. E. Long. 26. 25. N. Lat. 60. 34.

BORGÓ de St Sepulchro, a town of Tuscany, in Italy, situated in E. Long. 13. 0. N. Lat. 43. 30.

BORGÓ de val de Faro, a town of Italy, in the duchy of Parma, in E. Long. 10. 36. N. Lat. 44. 35.

BORGÓ Forte, a town of the Mantuan in Italy, situated at the confluence of the rivers Po and Menzo. E. Long. 11. 0. N. Lat. 44. 50.

BORGÓ San Domino, a town of Italy, in the duchy of Parma, with a bishop's see. E. Long. 10. 31. N. Lat. 41. 53.

BORGOGNONE, a celebrated painter, whose true name was *Giacomo Cortesi*; but he is commonly called *Borgognone*, from the country where he was born, about the year 1605. He was much admired and highly applauded for his admirable gusto and grand manner of painting battles. He had for several years been conversant

Borgia
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Borgognone.

Boria
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Boristhenes

versant in military affairs, was an officer of considerable rank in the army, made the camp his school, and formed all his ideas from what he had seen performed in the field. His style is roughly noble, full of fire and spirit, and there are a few prints etched by his own hand. Towards the close of his life he retired to the Jesuits convent in Rome, where he is said to have taken sanctuary to rid his hands of an ill bargain he had got of a wife; but happily surviving her, he lived in great esteem and honour till after the year 1675.

BORIA, a small town of Spain, in the kingdom of Arragon. W. Long. 2. 2. N. Lat. 41. 50.

BORING, in a general sense, the art of perforating, or making a hole through any solid body.

BORING of Water-pipes. The method of boring water-pipes is as follows. The poles of alder, which is a very useful wood in making pumps, water-pipes, &c. being laid on horses or traffels of a foot height, to rest the augre upon while they are boring, they set up a lath to turn the least end of the poles, to fit them to the cavities of the great end of the others. They turn the small ends of the poles about five or six inches in length, to the size they intend to bore the bigger ends about the same depth, viz. five or six inches. This is designed to make a joint to shut each pair of poles together, the concave part being the female part, and the other the male of the joint. In turning the male part, they turn a channel in it, or a small groove at a certain distance from the end; and in the female part they bore a small hole to fit over this channel. This being done, they bore the poles through; and to prevent them from boring out at the side, they stick great nails at each end to be a guide in boring. It is usual, however, to bore them at both ends; so that if a pole be crooked one way, they can bore it through and not spoil it.

BORING, in farriery, a cruel and absurd method of treating a wrenched shoulder. See FARRIERY, § xxv.

BORING, in mineralogy, a method of piercing the earth with scooping irons, which being drawn back at proper times, bring up with them samples of the different strata through which they have passed; by the examination of which the skilful mineralogist will be able to guess whereabouts a vein of ore may lie, or whether it will be worth while to open a mine there or no.

BORIQVEN, one of the Caribbee islands in North America, near that of Porto Rico. The English formerly had a settlement there, but were driven away by the Spaniards. It is at present without inhabitants, though agreeable and fertile; the air being wholesome, and the water good. There are a great number of land-crabs, whence some have called it *Crab-island*. W. Long. 64. 35. N. Lat. 18. 0.

BORISTHENES, (anc. geog.), the largest river of Sarmatia Europea, thus described by Mela, who copies *verbatim* from Herodotus: "It runs through a cognominal people, is the most pleasant of all the rivers of Scythia, and calmer than all of them in its course, and very agreeable to drink: it feeds very rich pastures, and produces large fish of the best flavour, and without bones; it comes a great way, rising from springs unknown; its course is a distance of 40 days; and so far it is navigable." It is now called the *Dnieper* or *Nieper*.

Borkele
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Borlase.

BORKELO, a strong town in the United Provinces, in the county of Zutphen, seated on the river Borkele, in E. Long. 6. 30. N. Lat. 52. 15.

BORLASE (Dr Edmund), an eminent physician and English writer in the 17th century, was the son of Sir John Borlase, master of the ordnance, and one of the Lord Justices of Ireland in 1643. He studied in Dublin college, and afterwards at the university of Leyden, at which last place he took the degree of doctor of physic. He afterwards practised physic with great success in the city of Chester, and was incorporated doctor of the faculty in the university of Oxford. Among the books which he wrote and published are the following. 1. Latham Spaw in Lancashire, with some remarkable cases and cures performed by it. 2. The reduction of Ireland to the crown of England. 3. The History of the Irish rebellion. 4. Brief reflections on the earl of Castlehavens memoirs, &c. He died after the year 1682.

BORLASE (William), a very ingenious and learned writer, was of an ancient family in Cornwall, and born at Pendeen, in the parish of St Just, Feb. 2. 1695-6. He was put early to school at Penzance, and in 1709 removed to Plymouth. March 1712-13, he was entered of Exeter college, Oxford; and, June 1719, took a master of arts degree. In 1720, he was ordained a priest; and, in 1722, instituted to the rectory of Ludgvan in Cornwall. In 1732, the lord chancellor King presented him to the vicarage of St Just, his native parish; and this, with the rectory aforesaid, were all the preferments he ever had. In the parish of Ludgvan were rich copper works, which abound with mineral and metallic fossils; and these, being a man of an active and inquisitive turn, he collected from time to time, and thence was led to study at large the natural history of his native county. He was struck at the same time with the numerous monuments of remote antiquity that are to be met with in Cornwall; and, enlarging therefore his plan, he determined to gain as accurate an acquaintance as possible with the Druid learning, and with the religion and customs of the ancient Britons, before their conversion to Christianity. In 1750 he was admitted a fellow of the Royal Society; and, in 1753, published in folio at Oxford his "Antiquities of Cornwall;" a second edition of which was published, in the same form, at London, 1769, with this title, "Antiquities, historical and monumental, of the county of Cornwall; consisting of several essays on the ancient inhabitants, Druid superstition, customs and remains of the most remote antiquity in Britain, and the British isles, exemplified and proved by monuments now extant in Cornwall and the Scilly islands; with a vocabulary of the Cornu British language. Revised, with several additions, by the author; to which is added a map of Cornwall, and two new plates." His next publication was, "Observations on the ancient and present state of the islands of Scilly, and their importance to the trade of Great Britain; Oxf. 1756," 4to. This was the extension of a paper which had been read before the Royal Society in 1753. In 1758, came out his "Natural history of Cornwall; Oxf." fol. After these publications, he sent a variety of fossils and remains of antiquity which he had described in his works, to be repositied in the Ashmolean museum.

Bormio
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Bormio.

museum: for which, and other benefactions of the same kind, he received the thanks of the university, in a letter from the vice-chancellor, Nov. 18. 1758; and, March 1766, the degree of doctor of laws. He died in 1772, aged 77 years, leaving two sons out of six, whom he had by a lady he married in 1724. Besides his literary connections with many ingenious and learned men, he had a particular correspondence with Mr Pope; and there is still existing a large collection of letters written by that poet to Dr Borlase. He furnished Pope with many of the materials which formed his grotto at Twickenham, consisting of curious fossils; and there may at present be seen Dr Borlase's name in capitals, composed of chrystals, in the grotto. On which occasion Pope says to Borlase in a letter, "I am much obliged to you for your valuable collection of Cornish diamonds: I have placed them where they may best represent yourself, *in a shade, but shining*;" alluding to the obscurity of the doctor's situation, and the brilliancy of his talents. Besides the above works, he sent many curious papers to the Philosophical Transactions, and had in contemplation several other works.

BORMIO, a county depending on the republic of the Grisons in Switzerland. It is bounded on the south by the estate of Venice, on the east by the territory of the house of Austria, and on the south and west by Caddea. It is 15 miles over both ways; and is divided into five communities, viz. the town of Bormio, the valley of Forbia, the Interior Valley, the Lower Valley, and the Valley of Luvino. Bormio is the only town in this district; and has a governor called a *podesta*, sent by the Grisons to preside in civil and criminal affairs. It is seated at the confluence of the rivers Addo and Isalacua, in E. Long. 10. 10. N. Lat. 46. 45.

BORNE, a market town of Lincolnshire in England. W. Long. 0. 20. N. Lat. 52. 40.

BORNEO, an island of Asia, in the East Indies, and one of the three great Sunda islands. It is thought to be the largest island in the world, next to New Holland; being 1500 miles in circumference. It is seated under the equator, that line cutting it almost through the middle. It is almost of a circular figure; abounds with gold; and the finest diamonds in the Indies are found in its rivers, being probably washed down from the hills by torrents. Here are also mines of iron and

† See Birds-
Nests.

tin, and loadstones. Birds nests† are to be had in this island, which are eatable, and reckoned a great delicacy. The beasts are, oxen, buffaloes, deer, goats, elephants, tigers, and monkeys. This island has fine rivers, especially towards the west and south. In their monsoon from April to September, the wind is westerly; and they have continual heavy rains, attended with violent storms of thunder and lightning. The rainy season continues for eight months of the year; and as during that time all the flat country near the coast is overflowed, the air is rendered very unhealthy, and the inhabitants are forced to build their houses on floats, which they make fast to trees. The houses have but one floor, with partitions made with cane; and the roofs are covered with palmetto leaves, the eaves of which reach within four or five feet of the bottom. The west and north-east sides of the island are almost desert, and the east is but little known. The inland parts are very mountainous; and the south-

east, for many leagues together, is a stinking morass, which being overflowed in the wet season, is very unhealthy.

The Portuguese, who first discovered Borneo, had arrived in the Indies above 30 years before they knew any thing of it more than the name, and its situation, by reason of their frequently passing by its coast. At last one captain Edward Corril had ordered to examine it more narrowly; and being once acquainted with the worth of the country, they made frequent voyages thither. They found the coasts inhabited by Malayan Moors, who had certainly established themselves there by conquest; but the original inhabitants still remain in the mountains, and are styled *Beajus*, which in the Malayan language signifies a *wild man*. The most authentic account of these people is the following, which was extracted from the papers of father Antonio Ventimiglia, an Italian missionary. He was sent to Borneo from Macao, on board a Portuguese ship, converted great numbers to Christianity, and died on the island about the year 1691. The Beajus have no kings, but many little chiefs. Some are subject to the Moorish kings, and pay them tribute; but such as live far up the country, are altogether independent, and live according to their own customs. They are generally very superstitious, and much addicted to augury. They do not adore idols; but their sacrifices of sweet wood and perfumes are offered to one God, who, they believe, rewards the just in heaven, and punishes the wicked in hell. They marry but one wife; and look upon any breach of conjugal faith, either in the man or woman, as a capital offence. The Beajus are naturally honest and industrious, and have a brotherly affection for one another. They have a notion of property, which yet does not render them covetous. They sow and cultivate their lands; but in the time of harvest, each reaps as much as will serve his family, and the rest belongs to the tribe in common; by which means they prevent necessity or disputes. With the Moors on the coasts the Portuguese for some time carried on a considerable trade, and at their request settled a factory there; which, however, was afterwards surprised and plundered by the Moors, who put most of the people to the sword. The most considerable river in Borneo is called *Banjar*, at the mouth of which our East India company have a factory.

BORNHOLM, an island in the Baltic sea, to the south-east of the province of Schonen in Sweden. It is twenty-one miles in length, and above thirteen in breadth. It has three considerable towns, Rattum, Sandwick, and Nexia; with a great number of villages; and is fertile and populous. It was conquered by the Swedes in 1658; but the inhabitants, under the conduct of Jens Roefods, voluntarily surrendered it to the king of Denmark, on account of the bad usage they received from the former. In 1678, a body of 5000 Swedish troops, in their passage from Pomerania to Sweden, being shipwrecked on this island, such of them as remained were made prisoners of war. The inhabitants defend the island by their own militia, without any expence to the crown. The commandant or governor resides at Rattum. E. Long. 14. 56. N. Lat. 55. 15.

BORNOU, a kingdom or province of Zaara in Africa, extending from 12 to 22 degrees of east longitude

Borneo
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